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ABSTRACT

This publication examines a range of public health issues in the Caribbean Basin including conditions responsible for the transmission of disease, folk palliatives, and factors affecting preventive and curative health services on the national level. Comparisons are also made among the various Caribbean countries. The book has seven chapters: (1) "Health Systems Development in the English-Speaking Caribbean: Towards the 21st Century"; (2) "Sociocultural and Ecological Factors Influencing Schistosomiasis in St. Lucia"; (3) "Maternal-Child Health and Ganja in Jamaica"; (4) "Hypertension and Culture Change in the Caribbean"; (5) "The Crisis of the Dominican Republic Medical Model: Alternatives for the Year 2000" (6) "Health and Development in Central America"; and (7) "The Dilemma of Success: Revolutionary Achievements in Nicaraguan Health." (KWL)

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# Health Care in the Caribbean and Central America

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The Editors
STUDIES IN THIRD WORLD SOCIETIES
Department of Anthropology
College of William and Mary
Williamsburg, Virginia 23185 U.S.A.
Phone: (804) 253-4522

EDITORS
VINSON H. SUTLIVE
NATHAN ALTSHULER
MARIO D. ZAMORA
VIRGINIA KERNS

PUBLISHER
DEPARTMENT OF ANTHROPOLOGY
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Publication Number Thirty December 1984

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## DEDICATION

To the memory of Vera Rubin

## ACKNOWLEDGMENTS

A great amount of credit and gratitude is offered to the staff of the Research Institute for the Study of Man for their essential dedication and efficiency which made the conference, "Caribbean Studies II," possible and successful; to Lambros Comitas, the current director of R.I.S.M., for his support and encouragement; and to the editors of *Studies in Third World Societies* for the professional and friendly manner in which they handled the preparation of this volume.

I also wish to single out for special thanks the faculty secretaries at the University of Pittsburgh at Greensburg: Mrs. Gerry Enlow, who provided intellectual incisiveness and moral support during the initial stages of the conference planning; and Ms. Elizabeth Palmer, who carried this volume to fruition with persistence and skill.

## VERA RUBIN 1911-1985

In the current era, within the social sciences of disciplinary particularism and specialization, it is difficult to imagine a scholar who by sheer energy, purpose and vision could influence and shape the research of an entire cultural region. Vera Rubin accomplished this in the West Indies by directing and encouraging work in fields as diverse as education, politics, race and ethnicity, social history, arts and public health. Over a career of some 30 years, Vera Rubin provided direction for several generations of Caribbean scholars. From the moment of her original intellectual commitment to the Caribbean community, Vera Rubin contributed a number of benchmark conferences, and publications, which collectively helped to establish the contours and trajectories of Caribbean studies. In rapid succession she helped present a remarkable compendium of Caribbean scholarship which guaranteed that Caribbean studies would be interdisciplinary, broad based and most significantly collaborative between scholars from the Caribbean and from Metropolitan societies. These early studies included *Caribbean Studies* (1957), *Plantation Systems of the New World* (1959), and *Social and Cultural Pluralism in the Caribbean* (1960). These pioneering syntheses and directives of Caribbean research would be added to in her career, most notably with *Comparative Perspectives on Slavery in the New World Plantation Societies* (1977) and *New Perspectives on Caribbean Studies: Toward the 21st Century* (1984). However, it is her singular contribution to the comparative study of health and health care with which we will most concern ourselves here.

In 1955 Dr. Vera Rubin founded and remained the lifelong director of the Research Institute for the Study of Man. It was under the auspices of R.I.S.M. that numerous medical anthropological research projects were sponsored: medical and social research in Bolivia, effects of chronic ganja smoking in Jamaica, research on hashish users, and a series of studies on the social, cultural and ecological factors affecting population processes in Korea, the Philippines, Jamaica, Colombia, Thailand and among the Hispanic population of the U.S.

Vera's contributions to medical anthropology can be dated with the three-day conference Culture, Society and Health in 1960. This international and interdisciplinary conference stressed those factors which Vera considered paramount to medical anthropology: cultural factors in disease response, fertility, mental illness and public health. In the same year while working in collaboration with the Caribbean Federation of Mental Health, which she helped found, she conducted a survey of 10,000 mental patients in 13 hospitals in 12 different Caribbean islands. The survey, administered in four languages, represented a pioneering exploration of the cross-cultural epidemiology of mental health.

In 1970-71 in collaboration with the present director of R.I.S.M., Lambros Comitas, she directed team research into chronic marijuana use in Jamaica and hashish use in Greece. This work culminated in the publication of Cannibis and Culture and Ganja in Jamaica. These landmark studies are on the cultural defining and conditioning of drug use.

Since 1978 R.I.S.M., in collaboration with the Academy of Science in the U.S.S.R., has been involved in a long range cross-cultural study of longevity by comparing the organic and socio-cultural factors affecting life expectancy in rural communities in the United States and the Soviet Union. This research project is significant for two reasons: the promising data source concerning the aging process, and the unique cooperation between U.S. and Soviet scientists.

Vera Rubin participated in many professional organizations and held several honorary degrees. She was president of the Society of Applied Anthropology, committee chairperson for the American Orthopsychiatric Association and at her death, the president-elect of the Caribbean Studies Association.

Because of her special qualities of empathy and caring, Vera was able to establish the complex and sensitive relationships that are required in rapport with the sick, ill and debilitated. She never forgot the groundings of anthropology in two worlds, that of the investigator and the hosts. She was accepted for this honesty and openness by both Soviet scientists and agriculturalists, and West Indian scientists and street people. Her capacities for empathy were never more evident than in We Wish To Be Looked Upon, a study of the aspirations of Trinidadian youth.

It was this sense of shared humanity which informed all her work: in her concern for the anthropology of health no less than her concern with the issues of slavery, race relations or education. All of these were to Vera restrictions to the human potential.

Vera's personal dedication to anthropology was to a tradition of commitment. She believed passionately that if inhumanities -- the numerous tragedies of ignorance and exploitation -- were preventable, anthropology was a means of prevention. If this vision strikes many of us in 1986 as naive or soft, it indicates the impoverishment of much of our present vision in the social sciences. Vera understood that the quest for knowledge was inseparable from the human context and the personal involvement which, therefore, all knowledge demands. She had the passion of her calling.

> "I bequeath to my family and my friends my love of life. May they spread pacem in terris and pacem in maribus. I urge all to live a creative life."

Vera Rubin, January 1985

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# INTRODUCTION

Frank McGlynn
Ian Rawson
Thomas Schorr
Christine Young

The aim of this collection is to introduce readers to the range of public health issues which are current in the Caribbean Basin. The significance of the volume lies in its genesis and the range of micro and macro issues and settings which are explored in the region. The papers were initially presented in the Public Health session of the conference "Caribbean Studies II: Toward the 21st Century." The first Caribbean Studies Conference of 1957 had pioneered an explicit program for applied or developmental anthropology in the Caribbean. This is contained in Vera Rubin's preface to the conference paper and in the presentations by James, Padilla, Manners and Braithwaite. The session on Public Health in the "Caribbean Studies II" conference reflects the growth and specialization of studies pertaining to public health in the Caribbean. The collection also reflects the concern of the conference organizers and sponsors, The Research Institute for the Study of Man, in presenting an interdisciplinary perspective on the main conference themes so that, for example, contributors in the public health session were social scientists as well as epidemiologists.

In addition to the range and levels of topics discussed in these papers -- i.e., the conditions responsible for the transmission and reproduction of health problems (Dressler and Dalton), folk palliatives (Dreher), and factors affecting both preventive and curative health services on the national level (Bossert, Carr, Garfield and Batista) -- there is the issue of comparative scope. The Caribbean Basin reflects a viscerally bewildering assortment of social formations. The nations of the insular Caribbean differ in size, population, national heritages, language and political systems. In political systems alone, the variations range from the contemporary archaism of crown colonies to the only communist state in the Western Hemisphere. Central America with its legacies of Hispanic colonization, large native populations, and relatively old republican institutions appears to share a separate trajectory from the insular Caribbean. But beyond the often bewitching kaleidoscope of the cultural and structural complexities for which the region is renowned, there exists the commonality shared by being at the vortex of the Plantation Zone of the Americas and the traditional, political and economic vulnerability of the region to global geopolitics. This commonality is reflected in the present U.S. administration's reference to the area in policy terms as the Caribbean Basin.

The central foci of these papers reflects the geopolitical definition of the region as well as the need to analyze and combat those conditions of underdevelopment manifested by the crisis in public health.

Modern medicine is the product of industrial civilization. The application of new medical knowledge to public health measures has made possible the potential control of disease vectors. Yet as all of the articles indicate, the success of curative or preventive medicine in a given country is itself a symptom of the economic distortions reflected by migration, urbanization and poverty and the concomitant health problems which are associated with sanitation, environmental pollution, overcrowding, and nutrition. Problems of public health, medical supervision, and social organization are seemingly intractable and threaten powerful vested interests. For the Caribbean, as well as globally, the medical achievements in the preventive and therapeutic capacity of medical knowledge and practice are probably of more relevance to the future than the past, and in all areas of the region, social reform or new patterns of social organization reflected in public health are needed. Neither medicine nor public health can be simply 'devolved', since they demand specific institutional agencies with the powers and resources sufficient to their task. Increasingly, for the Caribbean area, the health institutions, administrative bodies, and practices will define the nature of 'society' itself. It is obvious from the concerns expressed in these papers that the needs of the area's nations/territories to provide improved health care to more people at moderate costs is likely to dominate research practice in the area for some time. In particular, the organization and health impact of primary health care demand immediate attention. What is especially significant about four of the presentations in this volume -- those by Batista, Garfield, Dressler, and Bossert -- is their attempts to link the economic, political and cultural status of their respective populations to issues of radical change in public health conditions.

An explanation is required concerning the ordering of the articles in this issue. There are the usual organizational difficulties associated with a general theme in which participants were invited to present contributions reflecting differing levels of analysis with which many variables of change are operating within subject nations of widely differing stages of national development. We have presented the general policy and planning implications implicit in these papers and have attempted to order their presentation in this volume according to three conceptual works. Peter Carr's paper presents an overview of present public health system developments for the English-speaking Caribbean and in so doing, introduces the reader to the principal organizational and policy issues of public health within a comparative framework. Additionally, Carr sets the stage for considering "the health system process...and...the many parameters which condition the style of this process." The three articles which follow deal with particular situations of public health problems. Peter Dalton outlines the engineering and ecological management requirements necessary to control schistosomiasis in St. Lucia. Melanie Dreher presents a study of ganja use by lower-class women, during pregnancy and after, in Jamaica. William Dressler attempts to link the prevalence of hypertension to the strains associated with rapid and radical social change. All of these articles address the problems associated with planning and preventive care in the region.

The relationship of the individual's health to the changes in society is the theme of the papers by Dalton, Dreher and Dressler. Perhaps more than any other specialty of health care, the field of public health and its resultant priorities for interventions with populations are largely dependent on the critical relationship known in classic public health texts as the question of "man and his environment". In the developing nations of the Caribbean, rapid social and cultural changes produce concomitant changes in the health needs of the residents. As the authors indicate, a rise in economic status may be as detrimental to selected aspects of the health of the people as a decline. Relative financial independence, as in the case of maternal use of marijuana in Jamaica, may both adversely affect health while also creating a positive health impact of better nutrition during pregnancy with the added income to purchase food. Likewise, social changes such as migration, shifts in the mix of production of goods and services, and urbanization may lead to overall improvement in the health status of a population while fostering increased incidence of such diseases as hypertension and schistosomiasis for selected populations-at-risk, as illustrated by Dressler and Dreher. These articles place their observations in the context of a traditional paradigm which differentiates between curative and preventive health care, and underlines the relative cost-effectiveness of the latter approach. Garfield's article, for example, differentiates among the "Costa Rican" model of health care (doctor-provided in urban hospitals), the USAID-supported model (top-down delivery of services), and the grass-roots activism model of Nicaragua. Conventional wisdom concerning these models holds that the last one deals more directly with the majority of a developing nation's health problems at a minimum cost, while the former model tends to satisfy the ego needs of developing governments.

Other articles in the collection represent an emerging paradigm which takes a broader perspective. This approach differentiates between a traditional medical model for dealing with diseases and a multi-faceted non-medical model which addresses the developmental causes of diseases. In the latter approach, local efforts at disease prevention require coordination among health, education, agriculture, credit, and other interventions; this is paralleled at the national level by an integrated multi-sectorial effort in services planning and delivery. Dalton presents evidence of this in his article, which points out that one of the most effective methods of reducing schistosomiasis infection in St. Lucia was the installation of pure water lines at the village level. This general approach is also highlighted by Dr. Batista's view that, for the Dominican Republic, the crisis in health services is merely a component of the country's overall problems of economic development. Similarly, Peter Carr points out that in the English-speaking Caribbean, attainment of the WHO goals of Health For All by the Year 2000 will require a recognition that health is not the exclusive responsibility of the Ministry of Health. Other entities must collaborate in the coordinated multi-sectorial approach which focuses on the overall socioeconomic development process.

The basic contention of this second-generation paradigm is that the root sources of poor health lie in problems of sanitation, land tenure, food production, income security, education and credit. Efforts to deal directly with health problems have only short-range efficacy; a commitment to resolving the basic causes of disease is needed in order to assure long-term effects.

This is perhaps best exemplified by Bossert's review of health policy and implementation in post-revolutionary Nicaragua. Here, he reinforces the merit of the developmental paradigm through the example of the Sandinista commitment to systemic change. However, lest we fall prey to idealism and a belief in the perfection of any model, he points out that even the well-integrated goals of a revolutionary government may run afoul of the bureaucratic opposition of an entrenched administrative establishment.

The examination of processes of public health in an atmosphere of 'crisis' enables us to assess the important possibilities and constraints that condition the provision of preventive and curative health services in the area. It is hoped that this collection, offered in the spirit of the conference from which it was derived, will provide an impetus for further research in public health that makes especially significant the question 'for whom is research conducted?' rather than, 'what is being researched?'

# HEALTH SYSTEMS DEVELOPMENT IN THE ENGLISH-SPEAKING CARIBBEAN: TOWARDS THE 21ST CENTURY*

PETER CARR

Health Management Adviser
Pan American Health Organization
World Health Organization

This paper presents an overview of health systems development in the English-speaking Caribbean over the past five years, and identifies the conceptual framework of primary health care and the global goal of Health of All by the Year 2000 as the two guiding principles for this development. It offers a brief survey of the efforts by these countries to improve the efficiency and effectiveness of their health system. It also provides more detailed analysis of the health systems development process in Dominica and Jamaica, which differ in terms of population, geographic size, and the structure of the health services. Finally, a number of important issues which the countries of the region will need to face over the next two decades are identified. These pertain to management development, the financing of health services, and community participation; among others.

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*An abridged version of this article is being published in the Bulletin of the Pan American Health Organization-World Health Organization.

## The Meaning of Health Systems Development

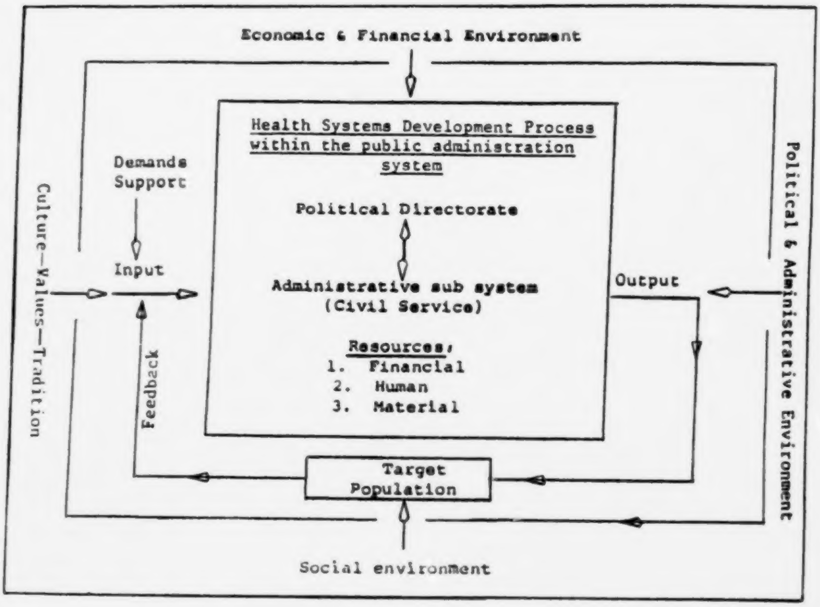
The health service of any country, including those of the English-speaking Caribbean, can be regarded as a system, comprising components or subsystems from the both the public and private sector which form a complex but unitary whole.1 In the English-speaking Caribbean these subsystems consist of the private health services, the traditional health services (e.g., traditional birth attendants, grannies, obeahmen) which form part of the private health services, and the government health services, which comprise by far the largest and most powerful subsystem. The government health services and one subsystem of the private health services utilize biomedical concepts in the provision of health services. The other subsystem of the private sector, the traditional health services, incorporates health concepts and beliefs from the various subcultures of the society.

The government health services form the largest, most visible and most powerful component or subsystem by virtue of its legal base, quantity of human and material resources, and access to power and authority. However, the other subsystems of the private sector undoubtedly exert considerable influence on the public health issues of the day. Because of the persuasive role of the government health services this paper will focus on these services as the prime mover for the development of the health system.

Using the system approach to analyze these services (see Figure 1) the public health services can be regarded as the "black box" of the system in which the political directorate interacts with the technical and administrative civil service machinery to develop and implement policies and programs to meet the needs of the target population or community served. In the development of policies and programs, the political directorate and the civil service machinery are faced with issues of support for existing services, as well as identification of needs resulting in demands for new services which will

FIGURE I

HEALTH SYSTEMS DEVELOPMENT PROCESS AND THE ENVIRONMENT


Economic & Financial Environment
Health Systems Development Process within the public administration system
Demands
Support
Political Directorate
Input
Administrative sub system (Civil Service)
Output
Resources:
1. Financial
2. Human
3. Material
Feedback
Culture—Values—Tradition
Political & Administrative Environment
Target Population
Social environment

require changes in existing policies and programs. The formulation and implementation of policies and programs involve the use of financial, human, and material resources. The majority of these are provided through the public administration system.

The public health services have an internal dynamic of their own through the utilization of human, financial and material resources and through administrative processes. Both these would serve the broad mission of the services as they interact with the wider environment.

The public health subsystem functions in a wider national environment which has a significant influence on the development and implementation of health policies and programs. One aspect of this environment deals with the culture and traditions of the society, and includes its values and norms, its views on authority and leadership patterns, and its general historical background. The social environment is another important aspect of this wider environment and involves such issues as class structure and mobility, the definition of social roles, the nature of social organizations, and the level of educational development. A third aspect is the economic and financial environment which deals with the general economic framework of the country, the type of economic organizations, fiscal policies and the level of scientific and technological advancement. Finally, there is the political and administrative environment which includes the general political climate of the society, the concentration of political power, the nature of political organization, and the accepted role and function of public organizations.[2] All the environments are subject to strong influences from the international world. In the health field these influences deal with such issues as concepts of health, technology, and medical care practices.

These health services should function as "open systems" in which the emphasis is not merely efficiency but rather on effectiveness in meeting the health of the populations served. The system approach, therefore, implies constant interaction and feedback from the environment to ensure that adjustments are made in the organizational process with the aim of improving the effectiveness of the services provided.

## Development and Its Relevance to the Health System

The concept of development, as it relates to Third World countries, is an issue that belongs to the wider field of development administration, of which health systems development is a small part. No attempt will be made to review the literature on this larger topic. However, a few brief observations of a general nature will be made on some of the pertinent development issues which relate to the health field.

For the English-speaking Caribbean countries, the development process involves the establishment of national consciousness, and of a social process in which the society places increasing value on its self-worth and develops self-confidence in its own efforts to resolve national problems. This process of development includes goal-setting for all aspects of national development and implies making use of national resources for the maximum benefit of the country. The concept of development also involves strengthening the machinery of government, particulary the bureaucratic system to make it a more dynamic instrument for change. These bureaucratic systems of the Caribbean have been geared more to maintenance of law and order and the "status quo" rather than meeting the needs of a society which requires a dynamic change process towards modernization.3

These concepts of development, which pertain to the wider public administration system, are also relevant to the health system which forms part of this wider system. The policies for the strengthening of the health system need to reflect this concept of self-reliance and self-worth, and to stress the use of technology appropriate to the values and the resource base of the society. The administrative reform of the Ministries of Health is one of the priority areas for development. They should become efficient and effective in the development and implementation of health policies and plans. As will be seen, strengthening the operational capacity of the health system has been a priority area for action in the countries of the Caribbean.

## The Goal of Health for All by the Year 2000

In 1977 the World Health Assembly agreed that the main social target for the governments of the world should be the attainment of a socially and economically productive life for their citizens by the year 2000 (Resolution WHA30.43). The Alma Ata Declaration reaffirmed this pledge in 1978. It named primary health care as the main strategy for achieving the goal of Health for All by the Year 200 (HFA-2000), in the broad context of national socioeconomic development and in the spirit of social justice.4 In 1978 the World Health Assembly urged member states to define and implement national, regional, and global strategies for achieving the goal of "Heath for All" (WHA32.30). Two years later this Assembly approved the Global Strategy of Health for All by the Year 2000, which presented guiding principles based on national experiences.5 In the Region of the Americas, the XXVII Meeting of the Directing Council of the Pan American Health Organization (1980) approved the Regional Strategies for achieving the goal of HFA-2000; the XXVIII Meeting of this Directing Council (1981) approved the Regional Plan of Action (Resolution XI). The countries of the Caribbean participated in all these international meetings. In June 1981 they reemphasized their commitment to primary health care in a workshop held in St. Lucia, where they explored the implications of this strategy for the development of the health services.

The goal of HFA-2000 means that health should be brought within the reach of everyone within a given country. In this context, health is defined not merely as the absence of disease but rather as a personal state of well-being which will allow an individual to live a socially and economically productive life. This concept implies the removal of obstacles to health, such as malnutrition, contaminated drinking water, and poor housing, as well as the provision of medical services for health care. "Health for All" is therefore a holistic concept calling for efforts in agriculture, industry, education, housing, and communications, as in medicine and public health.6

The concept of primary health care is the principal strategy for achieving Health for All by the Year 2000. The Alma Ata Conference defined primary health care as:

> Essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation, and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-deter-

> mination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family, and the community with the national health system bringing health care as close as possible to where people live and work, and constitute the first element of a continuing health care process.7

## Implications for Health Systems Development

One of the most important implications of the goal of Health for All and the concept of primary health care is that the health of an individual depends not merely on the absence of disease but on a complete state of "well-being." The achievement of this requires a multisectoral approach in which such issues as unemployment, poor housing, illiteracy, and poverty become major areas of concern. This is a significant change for all countries, including those of the English-speaking Caribbean, as it recognizes that health is not the responsibility of the Ministry of Health only but rather should be a social goal to which all other sectors must actively contribute. This requires the establishment of organizational forms which will ensure this collaboration and link it with an overall socioeconomic development process.

This multisectoral approach also has implications for the attitude of health officials in the utilization of national resources for health development. For example, it may be more beneficial for the health of a nation to put money into agricultural production or land reform rather than in hospital or health centre services to deal with problems of malnutrition.

Community participation is another basic element of the primary health care approach. This involves not merely "a temporary involvement of the community in health actions but a permanent educational process whereby the community's knowledge, efforts, cultural wealth and resources are harnessed in a well-informed manner in the pursuit of its total well-being.8 Health is not a commodity that should be given to a passive community. It must be generated from within the community itself and must be a response to demands from the community. In addition, a spirit of self-reliance must be developed at the individual, the family, and the community levels in the pursuit of the goal of health for all. People must be educated to understand what actions must be taken to bring about better health and be stimulated to take such action.

The Alma Ata Conference (1978) on Primary Health Care agreed that:

> The time has come for all levels of the health system to review critically their methods, techniques, equipment and drugs with the aim of using only those technologies that have really proved their worth and can be afforded. For primary health care this is vital because there has been a tendency to concentrate on medical technologies that are more appropriate for hospital use than for frontline care.9

The challenge is the selection of technology that is appropriate to the country concerned, scientifically sound, adaptable to the national situation, acceptable by the providers and consumers and maintainable within the resources of the country. Such a challenge has serious professional, commercial, and political implications. It often involves conflicts with the medical and allied health professions and with industries.

Finally, the development of the health infrastructure and its orientation in keeping with the primary health care approach - to ensure the extension of health services, particularly to the underserved populations - is an essential element for achieving the goal of HFA-2000. New policies, strategies, and plans of action need to be developed as part of a health systems development process. This requires an assessment of the national health situation, in the context of the socio-economic situation. It also requires development of policies, plans and programs, using the strategies of community participation and intersectoral coordination, and stressing promotional and preventive aspects of health, suitably combined with curative and rehabilitative measures. The health system has to be organized on the basis of levels of care to ensure accessibility of the population to the appropriate level of services required by the particular health problem. The strengthening of the health management process is therefore a key factor for infrastructure development. Not only does it include the development of policies, plans, and programs as indicated above, but also improving the system for the management of human, financial, and material resources. New and innovative approaches are required for making maximum use of these resources.

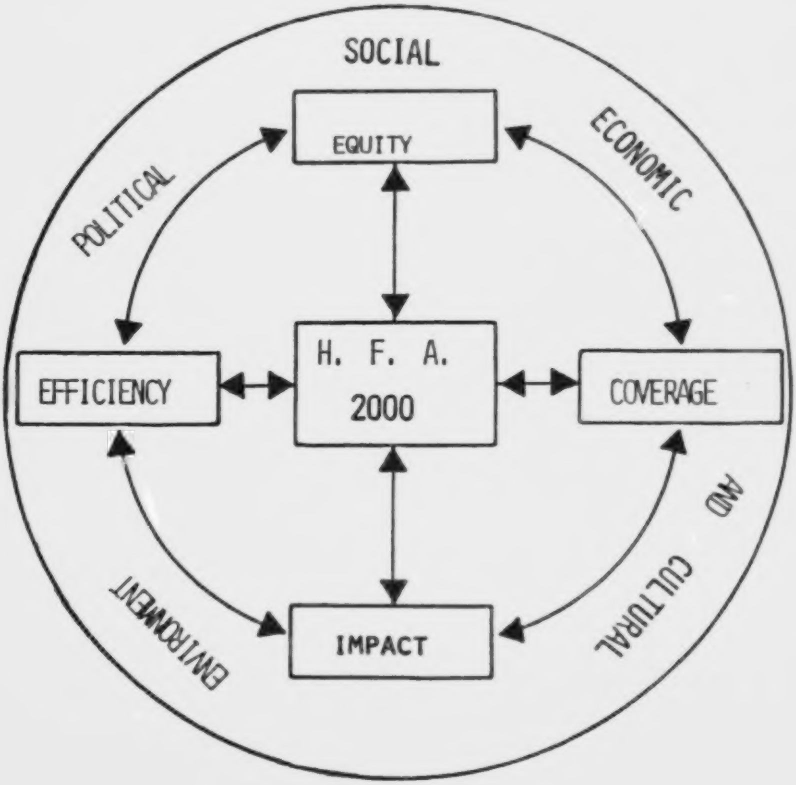
In summary, four key challenges (see Figure 2) have emerged to confront health managers as a result of HFS-2000 and the primary health care approach: equity, efficiency, impact, and coverage.[10] Equity is a highly significant social value which is debated in the sensitive arena of politics. Striving to reach the entire population places extreme pressure on the health system. Mechanisms for facilitating a more equitable access can be based on different values such as equal financial access and equal treatment for equal need. The former implies removing financial barriers for all. The latter implies eliminating all restrictions that affect the use of health services. It may be necessary to redefine the health financing system to stimulate utilization and accessibility of services. Each society, on the basis of its culture and resource possibilities, has to decide on the combination of values which will support the concept of equity.

Efficiency is the second challenge. The growing scarcity of resources and the increasing demand for services have been placing considerable pressure on health managers to make maximum use of available resources. The health services suffer from varying degrees of inefficiency through poor leadership and inadequate systems and procedures. This is typical of the governmental system, of which health is a part, and is a serious problem which requires urgent attention. The challenge of efficiency has become even more complex by ever-increasing specialization in the health field and an inexhaustible incorporation of new and more complex technologies for diagnosis and treatment.

Impact involves the selection of appropriate interventions for achieving the maximum health benefit, within the available technology. Transition from a state of less health to a state of greater health is the result of a complex set of factors, some of which lie outside the health sector. The impact of health depends not only on the utilization of services but is also closely related to social and environmental factors. What is needed is the development of critical minds among the leadership in the heath services. The evaluation process should also be strengthened, using appropriate research techniques to determine the impact of services and whether the approaches used were the most cost effective.

FIGURE II

CONCEPTUAL FRAMEWORK FOR DEVELOPING THE OPERATIONAL CAPACITY OF THE HEALTH SECTOR - KEY CHALLENGES


SOCIAL
ECONOMIC
AND
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COVERAGE
IMPACT

The final challenge is extension of coverage, which is closely intertwined with the other three challenges and is implied in the goal of Health for All. To extend coverage in a real world in which resources for health are dwindling involves a careful selection of priority programs, the allocation of resources to these programs, and the employment of new strategies to maximize the use of health resources in other sectors as well as within the community.

## General Health Situation

In many respects the health situation in the English-speaking Caribbean more closely resembles the health of the developed than the developing world (see Table 1). Life expectancy at birth ranges from 64.9 (Trinidad and Tobago) to 70.01 years (Jamaica). The infant mortality rate ranges from 16.2 (Jamaica) to 47.9 (Guyana) per 1,000 live births. The percentage of population with access to potable water ranges from 40.0% (Antigua/Barbuda/Redonda) to 100% (Barbados). Finally the number of hospital beds per 1,000 population ranges from 9.0 (Barbados) to 2.4 (St. Vincent).

Morbidity and mortality data for the Caribbean for the period 1970-80 also reflect the comparatively high standard of health within the region as compared with other developing countries. Complete data on mortality is not available for all the English-speaking Caribbean countries. However, a sample of mortality data from five or these countries (Antigua, Barbados, Dominica, St. Lucia, and St. Vincent) shows that the major causes of death were hypertension, cerebrovascular diseases, and malignant tumors. The percentage of deaths from tumors and hearth diseases for thirteen countries is given in Table 1. Among infectious diseases, diarrheal diseases occupy a leading place as cause of death, particularly in children under one year of age. Deaths from accidents increased in all the countries. Morbidity data for the region have been more comprehensive, although there are problems of incomplete data (underreporting) and lack of technical facilities for laboratory confirmation. Of the diseases preventable by immunization, tuberculosis, dyptheria, and whooping cough have gradually decreased. Poliomyelitis is almost nonexistent. Vector-borne diseases such as malaria and dengue exist, the former primarily in the mainland countries of Guyana, Suriname, and Belize, and the latter throughout the Caribbean.11

**Table 1. Basic population, health, and economic data for 13 English-speaking Caribbean countries—1984.**

| | | Population data | | | | Mortality data | | | | | Hospital bed and health personnel data | | | | Economic data | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Year of data (except as noted) | Population (in thousands) | % of population under 15 years old | Annual growth rate (%) | Life expectancy at birth (in years) | Infant death rate per 1,000 Live births | Deaths among young children (1–4 years) per 1,000 | % of all deaths caused by tumors | % of all deaths caused by heart disease | % of population served with potable water | No. of hospital beds per 1,000 inhabitants | No. of physicians per 10,000 inhabitants | No. of dentists per 10,000 inhabitants | No. of nurses per 10,000 inhabitants | Per capita GDP (in US$) | % of total health expenditure made by central government | Health expenditure per capita (in US$) |
| Antigua/ Barbuda | 1984 | 77(83) | 32.0(80) | 1.5(80) | 70.0 | 11.1(83) | 0.1(83) | 16.0(78) | 17.6(78) | 95(81) | 6.9 | 4.5 | 0.6 | 16.0 | 300(E.C. currency) | 11.8(83) | 184.0 |
| Bahamas | 1984 | 226 | 37.7 | 2.1(80) | 69.3(80) | 24.7(82) | 1.0(82) | 20.1(82) | 15.9(82) | — | 4.3(83) | 9.8(83) | 1.5(80)[a] | 42.9(83) | 6,046.0(82) | 14.7(82) | 207.0(82) |
| Barbados | 1982 | 250 | 29.4 | 1.0 | 70.0 | 17.6 | 0.6 | 17.1 | 20.5 | 100 | 9.0 | 8.8 | 1.2 | 30.0 | 3,603.0 | 14.6 | 241.0 |
| Belize | 1983 | 157 | 46.1 | 3.0 | 70.0 | 21.3 | 1.1 | 7.6 | 21.2 | 70 | 2.5 | 5.1 | 0.6 | 17.2 | 970.0 | 10.0 | 30.0 |
| Dominica | 1983 | 76.5 | 47.2 | 1.8(81)[a] | 74.0(f)<br>68.0(m) | 13.9 | 0.4 | 21.0 | 23.0 | 77 | 3.0 | 3.6 | 0.3 | 16.0 | 460.0(78) | 15.0(78) | 21.0(78) |
| Grenada | 1983 | 109 | 47.0 | 1.6(81)[a] | 67.0(f)(82)<br>64.0(m)(82) | 21.2 | 0.5(81) | 7.0 | 21.0 | 85 | 3.2(82) | 3.8(82) | 0.7(82) | 33.7(82) | 679.0(82) | 14.7(81)[a] | 34.0(81)[a] |
| Guyana | 1982 | 802 | 40.2(80) | 2.6 | 70.5 | 47.9(80) | 3.4(79) | 4.9(79) | 20.4(79) | 93(79)[a] | 4.5 | 1.2(80) | 0.2(80) | 6.5(80) | 1,559.0 | 6.3(83) | 70.0(83) |
| Jamaica | 1980 | 2,192 | 40.6 | 2.1[a] | 70.1 | 16.2 | — | — | — | — | — | 3.5(79) | 0.4(79) | 10.4(79) | 1,446.6 | 16.0[b] | — |
| Montserrat | 1983 | 12 | 30.5(82) | 11.6(82) | — | 21.6(81) | 0.0(81) | 9.4(81) | 6.0(81) | 53.1(80) | 5.7 | 3.4 | 0.9 | 34.1 | 3,565.0(82) | — | 80.7(81) |
| St. Christopher/ Nevis | 1981 | 45(82) | 44.8(82) | 15.2(80) | 65.0 | 46.0 | 2.5(80) | 11.1(83) | 17.0(83) | 100(83) | 5.6 | 5.8(83) | 1.1 | 56.7 | 3,064.0(82) | 12.3(84) | — |
| Saint Lucia | 1981 | 125 | 48.0(79) | 2.5(80) | 67.0(79) | 26.1(80) | 7.2(80) | 12.0(79) | 19.0(78) | 70(79) | 4.4(79) | 4.0(82) | 0.4(82) | 22.7(80) | 716.0(78) | 14.2 | 29.0(78) |
| St. Vincent and the Grenadines | 1982 | 128 | 22(81) | 2.2(81) | 68.5(80) | 41.8(81) | 3.7(80) | 7.4 | 19.5 | 75(81) | 2.4(80) | 2.9(80) | 0.6(80) | 10.4(80) | 544.0 | 14.2 | 10.0(81) |
| Trinidad and Tobago | 1983 | 1,149 | 33.6(80) | 1.7 | 68.9(80) | 19.7(80) | 1.3(78) | 10.6(78) | 25.5(78) | 95(84) | 4.1(80) | 10.5 | 0.9 | 28.3 | 6,691(82) | 9.5(80)[a] | 245 |

*Source*: Pan American Health Organization; Proposed Program and Budget Estimates: PAHO, 1986–1987; WHO, Region of the Americas, 1986–1987; and PAHO, Provisional Draft, 1988–1989, WHO Provisional Budget, 1988–1989; PAHO Official Document 199, Washington, D.C., July 1985.

[a] Data from the preceding program and budget estimates (Pan American Health Organization; Program and Budget Estimates: PAHO, 1984–1985; WHO, Region of the Americas, 1984–1985; and PAHO Provisional Draft, 1986–1987, WHO Provisional Draft Budget, 1986–1986; PAHO Official Document 187, July 1983.

[b] Includes social security.

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## Overview of the Health Development Process

The commitment of the English-speaking countries to the concept of primary health care and the goal of Health for All by the Year 2000 has been demonstrated by the number of countries which are in the process of developing their own health systems (see Table 2). Some countries have made more progress than others, but the majority have developed a health policy and health plan. Some of these policies and plans have been officially approved while others are still in draft form. The process used for the formulation of these policies and plans has varied from country to country, but in general has involved health staff at the head office and field levels of the health system. In the majority of cases, the countries have received support from an international agency such as the Pan American Health Organization/World Health Organization (PAHO/WHO) or a regional institution such as the Caribbean Community Secretariat (CARICOM). Such support has tried to institutionalize the planning process as part of the health services delivery system. In addition, the countries have sought to utilize an intersectoral approach, involving other sectors such as agriculture and education in this planning process.

A number of countries have also been involved in programming at the national and local levels as part of the process for implementing national policies and plans. This programming process has been based on national guidelines and manuals prepared for use in the specific country situations. In addition, specific projects are being implemented to strengthen the management support systems. For example, the supply management system for essential drugs and medical supplies is being strengthened in a number of countries with emphasis on developing formularies, streamlining procurement practices, and improving warehousing and distribution systems. Some countries have developed new approaches for financing the health services. Barbados has recently required all employees to pay a percentage of their salary towards a National Health Scheme, which is in the process of being introduced through the passing of the needed legislation. Some other countries are striving to improve the health manpower management process by developing health manpower policies and strengthening the management and utilization of health personnel.

Table 2. The status of health system development processes in the English-speaking Caribbean as of July 1984. The presence of each element specified is indicated by an "x."

| Country | Health development features present | | | | | |
|---|---|---|---|---|---|---|
| | Health policy | Health plan | National programming | Local programming | Management information systems | Management support systems |
| Antigua/Barbuda | x | | | | x | |
| Bahamas | x | | | x | x | x |
| Barbados | x | x | x | | x | x |
| British Virgin Islands | x | x | x | | x | x |
| Belize | x | x[a] | x[a] | | | x |
| Dominica | x | x | x | x | x | x |
| Grenada | x | x | x | x | x | x |
| Guyana | x | x | x | x | x | x |
| Jamaica | x | x | x | x | x | x |
| Montserrat | x | x | | | x | x |
| St. Christopher/Nevis | x | | | | x | x |
| Saint Lucia | x | x | | | x | x |
| St. Vincent | x | x | | x[a] | x | x |
| Trinidad and Tobago | x[a] | x[a] | | | | |

*Source:* Narrative country reports for 1984 prepared by PAHO.

[a] In the process of being developed.

The Health Management Information System has also been a major aspect of this development process. Ministries of Health have been defining and streamlining and data needed for management of the health services, improving the technology for generating and processing this data, and striving to train health personnel in the use of this data for management decision making.

The concept of community participation has been present in all these development activities, albeit to varying degrees of community involvement. For example, in the cases of Dominica and Grenada (before the October 1983 disturbances), local communities have been very interested in the planning and programming process. In some countries, such as Belize, the concept of community participation and team building is being supported; the aim is to strengthen the management process at the health district level, as a first stage, prior to their involvement in the national health planning process.

Since it is not possible in this paper to offer a detailed analysis of the development process in all the islands of the English-speaking Caribbean, a brief summary will be provided for two countries, Jamaica and Dominica. These countries have been selected not only because of their efforts over the past five years or more to develope their health systems, but also because they vary considerably in geographic and population size and in the size of their health services delivery systems.

## Dominica

Dominica is a mountainous island of 289 square miles and 75,000 inhabitants (1979). Heavy rainfall frequently leads to landslides, cutting off road contact to the affected sections of the country. Hurricane David in late August 1979 was a major landmark in the development of the health services; it completely destroyed the main hospital and forced government authorities to address the re-building of the health system.

In the era before this hurricane, the responsibility for the provision of public health services lay within the Department of Health and Medical Care, within the Ministry of Education and Health. The Minister made policy decisions on the advice of the Permanent Secretary. The position of Chief Medical Officer, with responsibility for providing technical advice and executing health policy and programs, had remained vacant for many years. This created a vacuum between technical personnel and the administrative arm of the ministry, which was organized on vertical lines of authority and command with no decentralization of authority to the field level.

The physical facilities of the health services comprised 45 health centers and clinics, three short-term "hospitals" of small bed capacity and a national "referral" hospital of 200 beds. The Public health nursing (health visitors) services were divided into eleven zones covering the island while there were only six districts for the district medical officers who provided the outpatient medical services for the island. These zones and districts did not coincide, causing organizational problems. Provision of services to the rural areas, where 90 percent of the population lived, was grossly inadequate. Of the six district medical officers, only two lived in their districts. The others lived in the city where they had private practices and paid occasional visits to their government clinics. The staffing of the clinics presented a problem because, in addition to the inadequate service from the doctors, there were a number without resident nurses; some were served by auxiliary nurses and retired midwives. There was no organized health information system as an integral part of a planning, programming, and budgeting process. Normally the hospital services accounted for 60 to 80 percent of the health budget, with the remainder going to the nonhospital health services. Health workers in these nonhospital services had little or no influence on the preparation of the budget or expenditure of funds.

On the basis of these fundings, the reorganization of the health services was initiated in 1980 and has continued until the present time. Three levels of responsibility and authority within the health services were identified: policy making, program formulation, and program execution. The policy making level comprises the Minister, the Permanent Secretary, and the new post of Director of Health Services. Their function is to establish health policy in keeping with the directives of government and the overall national development policies.

The program formulation level comprises specialist staff with national responsibilities for formulating and implementing programs in technical as well as administrative support areas. This level reports directly to the Director of Health Services and acts as a Central Technical Committee for the formulation of programs, the development of guidelines, norms, and standards, and the determination of priorities in relation to health manpower development. These functions are performed in close consultation with the program implementation level, and staff at the central level provide technical supervisory support to the field in the implementation of programs.

The program execution level comprises the community-based and the institution-based activities. The most important changes have been introduced in the management of the community-based services. District health teams have been established with responsibility for managing the health services at the district level. This team comprises all health workers at the district and community level as well as staff nurses from the district hospitals. The district teams are responsible for developing and implementing local programs, in keeping with national policies, plans, norms, and guidelines.

The health care delivery system comprises four levels of care: clinics, health centers, a proposed polyclinic, and the national referral hospital. Each clinic is to be staffed by a primary health care nurse to serve a minimum population of 6,000 within a five-mile radius. A health center is the administrative headquarters of each district and caters to a population of approximately 2,000. Services provided from this center cover environmental health, out-patient referral services, limited in-patient maternity services, dental services, and supervision of the clinics in the district. Seven districts have been established, each with a health center and a network of clinics.

The district health teams, under the leadership of the district medical officer, have been delegated authority and responsibility to manage the services at the district level. Norms, standards, and manuals have been prepared to guide the teams in this management process. Technical manuals have been prepared for priority programs such as environmental health and maternal and child care.

This decentralization process has included strengthening of the administrative support services. Districts have been allocated their own budgetary resources to be administered by the district teams. The supply management system for essential drugs has been strengthened by establishing a revolving fund, and by improving the procurement system, warehousing facilities and distribution systems to the hospital, health center and clinic levels. Referral systems between health centers and hospitals have been strengthened, providing transportation for staff and patients, and setting up telephone and radio communication systems.

Considerable emphasis has been placed on developing and implementing the programming process at the district level, and strengthening the information system in support of this process. This programming process begins with the definition of the catchment area for each health center and clinic. It involves delineating and mapping of houses and identifications of individuals within the catchment areas. The recording and reporting systems for programming have been simplified, streamlined and integrated into all aspects of program formulation, implementation, and evaluation.

Health manpower development has been an important element of this health systems development process. Dominica, like the rest of the Eastern Caribbean, has considerable difficulty in retaining trained health personnel. Faced with limited financial resources, limited promotional opportunities and the difficulty in influencing highly trained professionals to live in remote rural areas, the government decided to train and employ a new category of nursing staff, primary care nurses. The training for this new category of worker is community health oriented, dealing with the health problems and needs of the community. This training program consists of one year of general nursing, nine months midwifery exposure, and three months of internship.

In addition, considerable emphasis has been placed on management training and organizational development. Management and supervisory personnel within the health services have attended workshops on management and supervision, team building and the change process. This has resulted in improved communication between the levels of the system and increased emphasis on program planning and implementation.

## Jamaica

The health systems development process in jamaica took a similar path to that in Dominica, even though it was initiated two years earlier, in March 1977. Jamaica, with 2.1 million people, has the largest population of the English-speaking

Caribbean and is 144 square miles in size. Its public health services consists of 27 government hospitals and 346 functioning health centres (1982). In 1977 the government took the decision to stimulate the health systems development process through the formulation of a policy and plan, and to strengthen the operational capacity of the health system. This health planning process formed part of a wider goal to formulate a national socioeconomic development plan.

Of fundamental importance to this health systems development process, as in Dominica, is the fact that there was a strong political will in the Health Ministry in support of this process. This political will was evident in the continuous and active involvement of politicians in guiding the development process. The Ministry of Health established a steering committee comprising selected senior Ministry of Health personnel, Dr. Ken Standard from the University of the West Indies, Dr. Philip Boyd of the CARICOM health desk, and the PAHO/WHO Management Adviser in Jamaica. This steering committee functioned as the focal point of the process and established subcommittees to deal with policy formulation, health planning, and management development, including restructuring of the health organization. A health policy was formulated in 1977 emphasizing the goal of Health for All and the use of the primary health care approach as the main strategy for achieving this goal. The policy was prepared before the Alma Ata Conference in the same year, but reflected the essence of its declaration. The policy document was used to guide the formulation of a national plan, which was prepared by extended subgroups of the planning committee (comprising program managers and senior field officers) focusing on the program areas for which they had technical responsibility. This process was a slow one with several draft versions of the plan being prepared before the final version of the plan emerged.

The organizational development committee focused on the decentralization of authority and responsibility to the field level of the health services, and on redefining and strengthening the role of the Head Office. As in Dominica, the Ministry was defined under three broad levels: policy formulation, program formulation, and program execution. The policy formulation level comprised the political directorate and senior health advisers. The program formulation level consisted of senior health officers and middle-level health personnel, while the program implementation level comprised hospitals and health center-based services.

The health development process in Jamaica had been stimulated by two World Bank loans in 1970 and 1976. The first focused on improving the National Family Planning Program and developing rural maternity services through maternity centers and postpartum programs. The second Bank project provided for the integration of Maternal and Child Health and Family Planning Services, and emphasized a community-based delivery program for these services. In addition, this project gave strong support to the development of a Planning and Evaluation Unit in the head office of the Health Ministry.

The health policy identified many priority areas to be addressed by the health plan. These covered improving the management of the health services, health manpower development, environmental health, food and nutrition, and the health of mothers and children. The health plan for 1978-83 reflected these priorities. It proposed the decentralization of authority and responsibility to health area administrations, as units of the Ministry of Health responsible for the management of health services at the operational level. These administrations are being established for the management of nonhospital services in the first instance.

The health office of the Ministry was strengthened with the allocation of additional staff to the Primary Health Care Unit, the Epidemiological Unit, and the Statistical Unit. In addition, these management improvement efforts extended to the supply management system with strengthening of the procurement, inventory control and distribution processes. The personnel management system has been improved with the introduction of a computerized system for the preparation of post list and staff list for the approximately 12,000 employees of the Ministry.

Considerable emphasis was placed on the development of health manpower. A number of in-service training programs in management and supervision have been implemented. The training and employment of community health aides has been stepped up, with each of the 13 parishes in the country having about 100 such health workers. In addition, new categories of nursing personnel have been trained, such as family nurse practitioners, dental nurses, and pharmacy technicians.

In health facilities maintenance, the unit responsible for this, formerly in the Ministry of Works, was transferred to the Ministry of Health to ensure its more efficient operations and responsiveness to health needs. The internal management of the unit was improved by developing a work order system, providing testing equipment, acquiring technical manuals, and training maintenance personnel. In this area one of the international health organizations, Project Hope, has been very active.

The basic geopolitical unit for the delivery of nonhospital health services is the parish. These parishes are also the basic units of health administrations, where these administrations have been established. There are 13 parishes in Jamaica, varying in population size from 63,500 (Hanover, 1976) to 678,400 (the parishes of Kingston and St. Andrew, 1976). Within each parish the health centers are the basic units for nonhospital services. There health centers have been arranged in a network according to the level of care they provide. The type I health center serves a population of approximately 4,000 inhabitants and is staffed with a trained midwife and two community health aides. The type II centers are the next level of care and are staffed with a public health nurse and public health inspector, in addition to the same categories of staff in the type I health center. The type III health center provides the same services as types I and II, and functions as a referral unit for patients from them. The type III health center is staffed by a medical doctor, a family nurse practitioner, and several other health personnel. Some of the specialized services for health districts, which are the subunits of the parish, are provided at the type III center.

In addition to these planning efforts at the central level of the Ministry of Health, a series of team building exercises and workshops on programming were held for senior parish-level staff. A programming methodology was developed and used as a basic manual for guiding the process at the field level.[12] Programming workshops were held in all the parishes in an effort to strengthen the team, to identify priority programs, and to allocate resources for the implementation of these programs.

In 1981 additional strength was given to the management development process by establishing a Health System Development Team which emphasized the bottom-up approach in health planning and programming. This team selected one pilot district in each parish and worked for two years in strengthening the primary health care approach at the district health services level. Using an organizational development strategy the team conducted an analysis of the district health services and sent the results of this analysis back to the districts for their consideration and action. This process resulted in each district developing and implementing an action plan for improving their management process. The process emphasized community participation, intersectoral coordination, and the creation of a management team at the district level for planning and implementing the change process.

As in the case of Dominica, the results in Jamaica have been gratifying. The government is now revising its health policy as a first step in the continuation of the planned development process. This health systems development program has been affected by the socioeconomic situation in Jamaica, including continuous inflation and migration. The economic situation has led to a serious shortage of health professionals and of financial resources (local and foreign) to manage the Ministry of Health.

## Issues in Health System Development: Socioeconomic Scenario

Health systems development, particularly in the conceptual framework of Health for All, must take place within and be affected by the projected socioeconomic environment over the next two decades. Based on an analysis of socioeconomic conditions in the English-speaking Caribbean in the 1970s, the probable economic situation for the next two decades looks grim. The oil crisis of 1973, and the serious inflationary trends that followed, had a serious effect on the economies of the English-speaking Caribbean.

Within the region, for the decade 1970-80 Trinidad and Tobago achieved a GNP per capita growth rate in real terms of 3.9 percent, mainly because of petroleum and petroleum-based industries.[13] Barbados and Bahamas also recorded growth rates of 3.2 and 2.9 percent respectively, while Belize had a growth rate of 4.8 percent. However, the majority of the English-speaking countries had an GNP per capita growth rate of less than 3 percent, and in a number of countries there was negative growth. This shows the significant economic differences among the countries of the region.

Transnational corporations play an important role in the economic growth of countries in the region. They have large holdings in the industrial, mining, and agricultural sectors, and exercise great influence over trade and economic development. Shortage of foreign exchange has serious effects on economic development, and in some countries severe import restrictions have been imposed, affecting growth in the manufacturing and trading sectors.

The majority of countries in the Windward and Leeward Islands have very limited potential for growth, and depend heavily on agriculture and tourism. The servicing of foreign debts and the financing of balance-of-payments deficits will consume an increasing share of national resources. It will diminish those resources available for the social services. Clearly a new approach to economic development will be needed if countries are to maintain, if not increase, the level of health services provided.

The level of unemployment, as can be expected, has remained high, ranging officially from 15 to 30 percent of the labor force. This situation is being aggravated by the projected population growth of the Caribbean from 6.9 million in 1980 to 9 million by the year 2000. In 1980 38.7 percent of this population was under 15 years, 43.5 percent between 15-44 years, 12.7 percent between 45-64 years, and 5.1 percent over 65 years. By the year 2000 it is projected that 29.3 percent of the population will be under 15 years, 51 percent between 15-44 years, 13.5 percent between 45-64 years, and 6.2 percent over 65 years.[14] More people will therefore be thrown on the job market in a situation of declining economic growth. In addition, the demand for health services will be considerably increased, at a time when resource allocations to health will be declining.

## Management Development and Leadership Issues

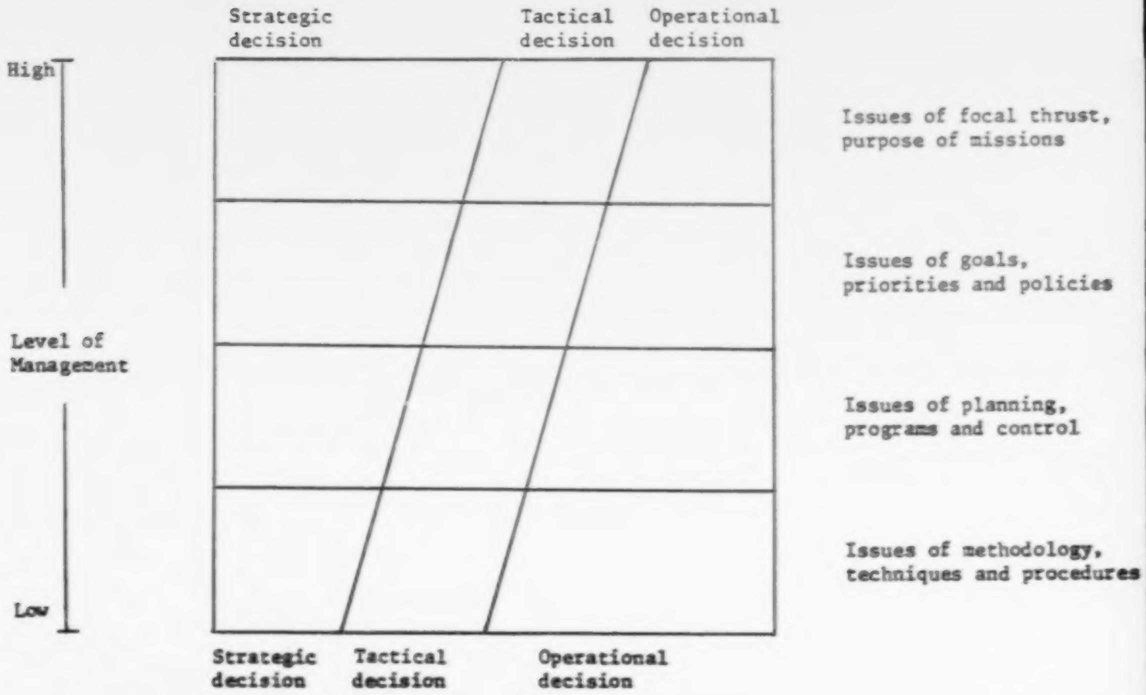
One of the most critical questions is how to provide managers within the health services with the appropriate knowledge and skills to deal with the managerial challenges ahead. This is not only a matter of developing training programs that address the important issues faced by these managers but also of evolving strategies that will retain such personnel in the health services. Tertiary-level educational institutions such as the University of Guyana and the University of the West Indies must take the lead in creating such programs as a subcomponent of their wider management development programs. Initial steps have already been taken at the University of the West Indies to develop a health management program within the Faculty of Social Sciences.

The retention of such trained personnel within the health services and even within the public services, given the demand for trained managers in other sectors of the public services and in private enterprise, is another problem that the health system will have to address. Given the centralized nature of the personnel management function within the public bureaucracies of the region, the ministries of health have little control over the conditions of employment for such managers. They will have to exert considerable pressure, therefore, on such controlling ministries as the Ministries of Finance and of the Public Services so that more emphasis can be placed on the recruitment and retention of good managers in the health services.

The tasks of these managers, according to their organizational levels, also need to be defined. There is need for a balance between strategic, tactical, and operational decisions at the different administrative levels within the health services (Figure 3). At the lower management levels, the emphasis is more on the implementation of methodologies, techniques, and procedures, and on making operational decisions. At these levels there is limited involvement in strategic and tactical decision making. At the higher organizational levels however, greater emphasis must be placed on the determination of the focal thrust, purpose and mission of the health services, and the establishment of goals, policies, and priorities. Senior management within the health services is slowly moving in this direction but old bureaucratic habits die hard, and managers spend too much time in dealing with operational issues and too little on strategic issues for the future development of the health services.15

FIGURE III

Balance of Strategic, Tactical, and Operational Decisions at various Management Levels


Strategic decision
Tactical decision
Operational decision
High
Level of Management
Low
Issues of focal thrust, purpose of missions
Issues of goals, priorities and policies
Issues of planning, programs and control
Issues of methodology, techniques and procedures
Strategic decision
Tactical decision
Operational decision

## Financing of the Health Services

The projected socioeconomic scenario up to the year 2000 suggests that financial resources allocated to health services provided by the governments will be reduced and more resources allocated to the productive sectors. In this respect, health is regarded as a consumer and not a producer of resources. These reductions will occur not only in the allocation of resources to the Ministry of Health but also to the private health sector, particularly in the allocation of scarce foreign currency for the purchase of medical supplies and equipment. Shortage of foreign currency is an issue that extends outside of the health sector and will need to be addressed in the wider arena of national economic development. Some countries, such as Jamaica and Guyana, have sought to mitigate this shortage through bilateral trade arrangements with foreign countries.

Within the national health sector, however, some efforts are already being made, notably in Barbados, to impose a health levy on salaried workers, and to utilize this funding in the provision of health care. The government of Barbados is in the process of establishing a National Health Service, financed primarily from general revenue and a 1 percent levy on income. In addition, user charges are collected at hospitals, laboratory and x-ray services, and in the drug service. The present trend is to develop a comprehensive national health insurance scheme, to be co-financed by employers and employees, to enable patients to see any doctor of their choice and eliminate the payment of fees at the point of service. The Trinidad and Tobago government has also introduced a similar levy on salaries and is exploring options for developing its health services.

In any such negotiations on financing, interest groups such as the medical profession must be involved, as a major objective of such a scheme is to involve private practitioners in a government-financed scheme that will allow citizens to pay a fixed percentage of their salary and receive services according to their needs. If the philosophy of primary health care is to be observed, then equity has to be a guiding principle in any system of financing and provision of services that is introduced. In addition, a number of safeguards must be employed to ensure that there is no abuse of the system either by the providers or receivers of health care.

## Strengthening of the Operational Capacity of the Health System

Intersectoral coordination is a critical element in the development of health services. Since health is not merely the absence of disease but a state of mental and physical well-being, other sectors such as agriculture, education, mining and natural resources, and community development contribute to it. The government bureaucracies of the English-speaking Caribbean tend to function along vertical lines with inadequate mechanisms for meaningful coordination between ministries. Committees set up for this purpose usually have power only to recommend but not take action to change policies. Often the efforts of these coordinating committees become fruitless through lack of authority to implement recommendations. The health activities of other Ministries tend to be focused more on prevention and promotion activities than on curative and rehabilitative services.

Given the growing scarcity of resources, health promotion and prevention strategies must receive priority. This requires a broadening of the vision of health administrators to support the allocation of resources to other sectors, rather than the Ministry of Health, to achieve maximum impact on health.

Intersectoral coordination between the private and public components of the health sector is another critical issue. The former not only includes the officially accepted health professions but also those that emerge from the traditional health system (e.g., birth attendants, nannies, obeahmen). Given the limited human and financial resources available to the governments, the upgrading of skills and the formal incorporation of such traditional health workers must receive serious consideration. Even coordination with the officially accepted health professions in the private sector (doctors, dentists, etc.) tend to be weak, with the government usually on the retreating end of contentious issues. This private sector must be treated as one element in the operation of the system and should not be allowed to dominate the health development process.

Several countries have been addressing the issue of reorganization of health services and decentralization of the decision-making process. The primary health care strategy implies the provision of increased decision-making authority to the peripheral levels of the health system. However, there are powerful economic forces, in some countries where the economic crisis is deepest, to retain tight control over the use of financial resources. The "areas of freedom" for the decentralization of authority are therefore limited. Nevertheless, if increasing emphasis is to be placed on liberating the Head Office of the different Ministries of Health from being involved in too many operational issues that can be best handled at the field level, then this decentralization process must continue with proper monitoring and evaluation to ensure the efficient and effective use of resources.

One major reorganization proposal; suggested from time to time, is the removal of the hospital services from the Ministry of Health and the creation of a public corporation to manage these services. The only advantage of such a system is that it supposedly allows the management process to be free of "red tape" and to be more flexible and dynamic in its decision making. Yet this end can be achieved by administrative reforms within the public administration system and in the Ministry of Health itself, rather than by establishing a public corporation separate from the Ministry of Health. The problem of bureaucratic red tape should be solved not by creating a separate organization but by administrative reform within the ministry.

Most of the countries have established, within their ministry of health, a decentralized system of administration either by establishing area administrations, country health services, regional health services, or district health services. The problem of relatively small size, as is the case in the Eastern Caribbean, has not been a deterrent to this process. Given the scarcity of resources within the government system, such decentralized administrative units, must justify their existence by improving the management process within the health services and not merely creating an additional administrative layer through which all decisions flow to the central level.

The health planning and programming process will become more critical as demand for services increase and resources become increasingly inadequate to meet these demands. The identification of priority health problems, at national and local levels, and the development and implementation of programs to resolve these problems in the most efficient and effective manner will become increasingly important. Appropriate methodologies for this planning and programming process should be developed in keeping with each national situation. The establishment of a health planning unit may not be feasible for countries with limited resources. What becomes important is the involvement by key health personnel in the process, utilizing them as a part-time planning unit.

The management of administrative support services such as supply management for drugs and medical supplies, personnel management, transport management and the maintenance of health facilities and equipment will require priority attention. This is not only to ensure that timely and appropriate support is given to the delivery of services, but also that maximum use is made of scarce resources. The maintenance of buildings and equipment will require special emphasis to maximize the returns of investment. Too often little attention has been given to the allocation of resources for this purpose. The selection, utilization, and maintenance of health equipment, and the procurement, storage, and distribution of drugs and medical supplies must be examined carefully. It is important to rationalize these processes, to reduce waste, streamline costs, and strive for maximum efficiency and effectiveness.

The selection and utilization of appropriate technology is closely related to the problems of drug supplies, equipment and management systems in general. It involves the creation of positive programs for the recognition and stimulation of national initiatives in developing technologies that are appropriate and affordable by the country. Such technology should be scientifically sound and acceptable to both the health providers and the community. The general trend in the English-speaking Caribbean has been to import technology at a high cost. Frequently it is underutilized or the country lacks the capacity to sustain the use of this technology.

The impact of medical technology on increasing health costs, at a time when resources are dwindling, emphasizes the need for a methodology to assess and evaluate the effectiveness, acceptability, reliability and cost of such technologies. There is need to stimulate the creativity of members of the health team of the technical institutions and of the wider community, to expand the technological horizons, and to develop technologies that are appropriate to the national socioeconomic situation.

## Management Information Systems

The need for relevant and timely information to support all aspects of the management decision-making process has been stressed by all the countries of the region. The present efforts at organizational development within the region have all included streamlining the collection, storage, processing, and distribution of information. This has formed an integral part of the planning and programming process and of the management of human, financial, and material resources. Information is the lifeblood of the management process.

Data collection within ministries of health has tended to be uncoordinated and relevant to the needs of specific individuals rather than as part of an integrated information system. Frequently there is duplication in the variety of data being collected and considerable time is wasted in collecting the same data, in a slightly different form, for different organizational units of the ministry. Most times very little use is made of the data for decision making as the data is not timely. In addition, insufficient efforts have been made to train health professionals in the use of data for decision making.

A critical assessment of the management information system is required to determine the data needed for decision making, the methodology to be used in gathering this data, and the technology to be used for processing, storing, and updating it. Above all health professionals must be trained in the utilization of this data in their daily functions to monitor and evaluate existing programs and to adjust national plans and programs in the light of this assessment.

## Health Manpower Management

The health services system is labor intensive in its functions, and more than two-thirds of the budget of a Ministry of Health goes towards the payment of salaries and wages. The countries of the English-speaking Caribbean are giving considerable attention to the heath manpower issues. Over the past decade they have created a number of new categories of health workers to cope with the loss of health professionals and the ever-increasing demand for services. The family-nurse practitioner, medical officer, pharmacy technician, environmental assistant, and community health aide are some of the new categories introduced. These have functioned mainly in the nonhospital services.

The retention of health professionals in the national health system, particularly the highly trained professionals, has always been a problem for the countries of the region. Such losses have occurred either through migration to North America, or from the smaller to the larger Caribbean islands, or even to the private sector within the same country. The loss of highly trained health professionals is a serious problem, particularly for the smaller island states and those severely affected by economic depression.

One of the weaknesses of the health manpower system is in the projection of future needs. This is being addressed through strengthening the health planning process. However, frequently there is insufficient coordination between the institutions that prepare the health professionals and the ministry of health which employs these health professionals. Some attempts have been made to orient the training of such professionals to the primary health care approach, but not without strong resistance from some professional groups.

The distribution of health personnel is very uneven, with the majority residing in the urban areas. If extension of coverage and accessibility are major objectives of the health system, then a solution has to be found so that such professionals can be motivated to work in the rural areas. Motivation of health professionals in the public sector is also an issue that needs to be addressed. This low motivation derives not only from relatively low salaries but also from conditions of employment in which there is a shortage of equipment, supplies, and transport as well as poor maintenance of the health facilities.

Perhaps the major challenge in manpower development and utilization is increasing the productivity of health workers. The factors mentioned above all have significant bearing on this, and would need to be addressed. However, task analysis should be conducted, on a limited scale, to ensure that health professionals perform the tasks they have been trained to do, and they do not perform tasks which normally should be done by lesser trained personnel.

## Community Participation and Education Issues

Community participation and education are key components of the health systems development process in the region. The rationale for this is that communities must assume increasing responsibilities for their own health, and to this end health education will provide the necessary knowledge to enhance the concept of self-care. Promotion of good health and prevention of illness are less costly than curative and rehabilitation services.

All of the countries have established health education units, and some have developed health education policies and programs as an integral part of the health systems development process. This health education process has been linked with other sectors such as education and agriculture. In the same manner efforts at community participation have strong linkage with ministries such as those responsible for community development, or with local government.

As indicated during the recent Caribbean Conference on Education and Community Participation for Health in the CARICOM Caribbean, discrepancies still exist between the stated support for education and participation in health and in the allocation of resources to meet these objectives.[16] Further, given that community education and participation in health are not health matters but relate to the wider socioeconomic environment, any progress will be limited by this wider environment. In a number of countries this concept is being fostered without clear guidance from national policies on the role of the community in socioeconomic development.

The precise role of the community in health needs to be defined. On the one hand, it could mean merely the passive obedience of the community to support and follow the health programs as defined by the government. On the other, it could mean empowerment of the community to be completely responsible for its own health, with technical support from the professionals. Although this has not been articulated there is still the tendency to see the community as providing support to the Ministry of Health's program. Such an attitude maintains the passive role of the community and reinforces the behavior of some health professionals who are reluctant to share power over the planning and programming of health services with the community.

## Conclusions

The health systems development process is quite complex, and has many parameters. The basic requirements of the concept of primary health care and the goal of Health for All by the Year 2000, as discussed above, provide one parameter for this process. Another is the projected national socio-economic scenario and the national style of socioeconomic planning. The characteristics of the health systems development process include the elements of dependency on the wider national system, the complexity, fragmentation, and uncertainty of the change process, and the conflict which it generates. This change process involves the style of health planning adopted, determining the desired health system as a focus for change, establishing viability and negotiating proposals, reconciliation of the intended development process with the available opportunities, and the monitoring and evaluation of the total process. This process, in turn, is conditioned by the characteristics of the public administration system, its decision-making process and capacity to respond to change.

All of these factors indicate that the development process is not linear but rather spiral. It is not possible to anticipate all the constraints or problems that will hinder the achievement of the desired health system. In addition, the desired system is adjusted as new insights are gained into the present system and the feasibility of achieving change and the nature of the system that should be established. The English-speaking Caribbean countries are fully involved in this process and striving to make "health for all" a reality by the year 2000. In the past there has been limited sharing of experiences among the countries, mainly through seminars and workshops, and through the occasional utilization of Caribbean nationals as consultants to share their experiences with other Caribbean countries. This can be remedied by establishing information mechanisms for sharing national experiences and encouraging countries to learn from each other's experiences.

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# SOCIOCULTURAL AND ECOLOGICAL FACTORS INFLUENCING SCHISTOSOMIASIS IN ST. LUCIA

PETER R. DALTON
Hunter College

Sociocultural factors have a broad impact on the transmission of an important and rapidly expanding disease, schistosomiasis, in various regions throughout the world. Here I am specifically focussing on the Caribbean and, in particular, the island of St. Lucia (Windward Islands), where I was involved as a sociologist in a control scheme from 1968-1974. I might add that while sociocultural and ecological factors influence the disease process, and I shall be dealing with this topic, there is a two-way effect: the results of the disease itself have sociocultural and ecological ramifications, and I shall touch on some of these. But first let us examine the life cycle of schistosomiasis.

## The Schistosomiasis Life Cycle

Schistosomiasis is widespread throughout the tropical world, infecting more than 200 million persons in over 70 countries. It is a fluke (trematode) that lives in human blood in small veins in the intestine (S. mansoni, S. Japonicum), or the bladder (S. haematobium) and can survive there for a number of years. The adult male and female worms usually live in pairs and reproduce in the body, the female producing hundreds of eggs per day, some of which remain in the surrounding tissues, the remainder being passed in the feces or urine, depending on the species. When the eggs reach the water many of them hatch and become miracidia, small larvae which must find an appropriate snail host or die. In the snail each miracidium develops into thousands of cercariae, the form that is infective in humans, which swim around searching for a human host. Upon finding a host they penetrate the human skin and change into a pre-adult (Schistosomula). They then pass into the bloodstream, migrate through the lung, and then the liver, where they mature. After this they travel to the veins around the bladder or intestines, thus completing the cycle.

The essential conditions of the life cycle are:

1) There must be a sufficient number of human hosts with a modicum of infection, and who are in contact with fresh-water bodies, in which the larvae are able to survive.

2) There has to be a sufficient number of snails and degree of susceptibility for the larvae to penetrate.

## Schistosomiasis in the Caribbean

In a number of tropical countries the necessary conditions of the schistosomiasis life cycle are met in varying degrees, which explains the uneven distribution of the infection. This is particularly the case if a survey of the Caribbean as a whole is undertaken. In many of the islands either the snail is not present or, in others where the snails have been found, the level of infection in the human population is too low. This situation, however, is apparently changing with a number of previously uninfected countries now being at risk.

Sturrock and Sturrock have identified transmission as taking place in the following countries: The Dominican Republic, Puerto Rico, Vieques, St. Maarten, St. Kitts, Montserrat, Antigua, Guadeloupe, Martinique, and St. Lucia.1 (Some years earlier, Ferguson et al. reported that the infection was no longer present in St. Kitts and Vieques.2) Transmission has been reported on the South American mainland in Venezuela and Surinam. Jamaica, Trinidad, Grenada and St. Vincent are apparently free of *Biomphalaria glabrata*, the most important snail host for the Caribbean, but they have populations of *B. straminea*, which are difficult to infect because of strain differences. Ecological conditions, however, are probably favorable for *B. glabrata* once it is introduced. In Dominica *B. glabrata* has been recently introduced although no human cases of infection have been reported. Barbados is free both of *B. glabrata* and infection, though *B. helophila* is present and has a low susceptibility.[3]

The picture of the region as a whole is variable. The possibility of an overall expansion of the disease, however, is real, especially for a number of those currently uninfected islands in which the snail host *B. glabrata* can survive: notably, St. Vincent, Dominica, Grenada, and possibly Trinidad. In this sense, the Caribbean is following a world-wide trend in which increasing population densities, and the subsequent introduction of agricultural practices involving greater human contact with water bodies, have increased the danger of schistosomiasis spreading. It could become a major public health problem ranking second only to malaria in importance as a tropical disease.

## A Systems Approach

In recent years it would appear that the most dramatic expansion of schistosomiasis in the Caribbean has taken place on the island of St. Lucia. I shall explore the reasons for this, especially those factors related to the behavior of the human host. In order to understand the way in which social and cultural factors have impinged on this particular disease in St. Lucia, and quite probably other tropical disease entities as well, it is imperative to look at the total socio-ecological complex as consisting of interacting sub-systems. Taken together, they form an integrated whole with varying degrees of cohesion, and part of a developmental sequence.

To identify some of these subsystems and the way they interact, conflict, and combine with one another, I shall here regard St. Lucia during the period of the 1950s to the present as a case study. This makes it possible to unravel some of the influences that led to the dramatic emergence of schistosomiasis in that island, followed by a fairly rapid decline. In order to elucidate this emergence I have constructed a qualitative model of the relationship between the various sub-systems at work during this period. To understand this model it is necessary to look at the historical context in which it is set.

## History of the Disease on St. Lucia

While the evidence is not always clear cut, the sudden shift in the St. Lucian economy during the 1950s, when it changed from being based on sugar production to bananas, provides something more than a backdrop against which the disease rapidly spread throughout the island. The rise and fall of the banana industry coincides closely with corresponding changes in infection rates.

The first published account of schistosomiasis in St. Lucia was that of Panikkar in 1961.[4] It was probably stimulated by the infection of three American tourists at Soufriere, a town in the southwest, lying at the foot of the beautiful Piton Mountains. Prior to this Dr. Wells, Chief Medical Officer, had carried out a number of stool examinations in 1959 at the Victoria Hospital at Castries where he found patients from other areas also infected. Before 1960 there had been no reports of schistosomiasis from areas situated on the eastern part of the island. After that date the number of such cases in the hospital records increased.

Although these records are necessarily biased in that they only refer to those patients attending the Castries hospital, they suggest that during the 1950s and 1960s the disease spread from two initial foci, Soufriere and Castries, across the island. This took place at a time when a new and important socio-ecological 'upheaval', associated with a new cash crop, bananas, was taking place on the island.

## Sociocultural 'Pathways'

At least two alternative pathways suggest themselves with respect to the sequence of events leading to the rapid increase in infection rates in the 1950s and 1960s. These are not necessarily mutually exclusive and probably have reinforced one another.

The first pathway is associated with an increase of population movement arising from the new capital inputs associated with the introduction of bananas as a cash crop.

For example, a new road linking Castries and Dennery on the eastern coast, and the closing of the port at Dennery which had been used for the sugar industry, accelerated the movement of persons, both short and long term, between the western and eastern sections of the islands. A U.N. survey on transport movements throughout the island at this time supports this contention. Infected persons from the foci, Castries and Soufriere in the west, now came into contact with snail populations in the Richefond valley in the east, and Deruisseaux further south. This increased the contamination levels at the local water contact sites frequented by the entire population.

Another pathway, which is equally plausible and which probably existed simultaneously with this increase in population movement, was socioeconomic and ecological changes associated with new agricultural practices. In order to assess these changes and their implications, I shall briefly sketch the agricultural systems and type of social structure in the three former "sugar" villages of Roseau, Richefond and Cul-de-Sac in the 1950s.

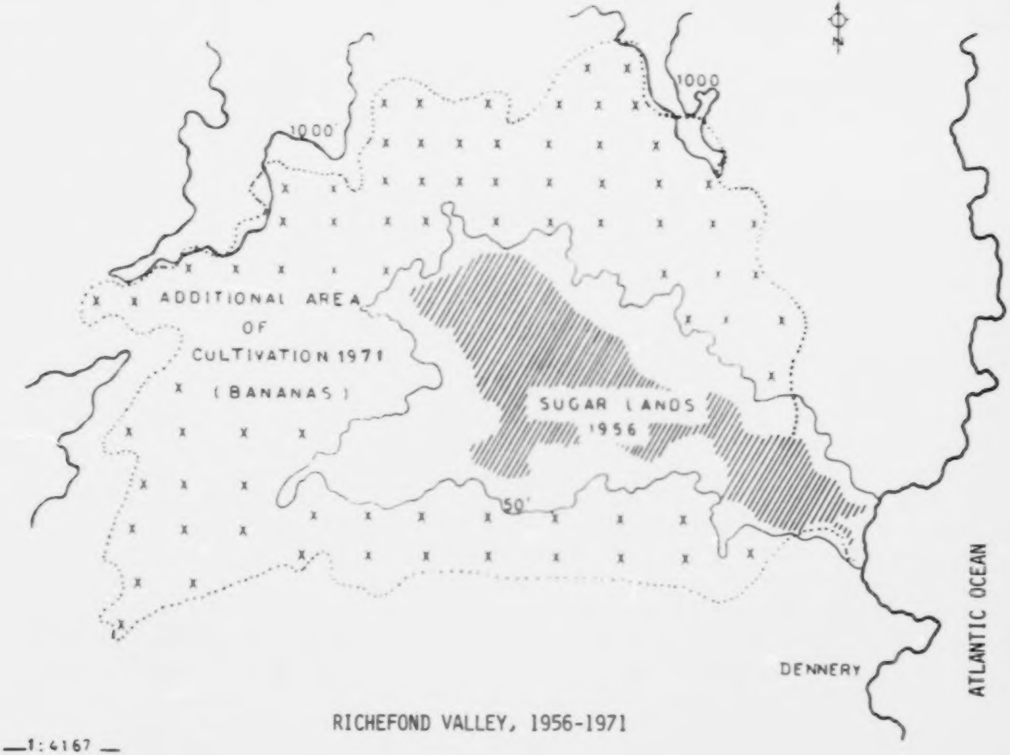
Before the changeover to bananas, St. Lucia might be characterized as a "plantation" society.5 In each of the three major valleys, the valley floor was owned by one large company and was covered with sugarcane. Gangs of laborers were employed to grow and cut the cane, supervised by company officials. These laborers and their families dwelt in small settlements on land owned by the company. In addition to land on the valley floor, the laborers and their families cultivated other crops ("ground provisions") on the steep valley slopes. This took place on government land or "family" holdings. The family groupings in this context could be characterized as bilateral "kindreds" in which both male and female descendents had varying claims on the land. This system was, and is, influenced by the different forms of marriage, which range from legal unions to brief de facto arrangements.6

## The Changeover

The transition to bananas completely transformed the socioeconomic and ecological structure of the three valleys. Whereas the sugar industry was largely confined to the valley floor, dominated by the large companies, and seasonal; the banana industry expanded up the valley slopes, continued throughout the year, and involved the participation of the small grower (see Figure 1). Small growers converted their subsistence plots to bananas and were then less dependent on the plantation for a livelihood. This had a number of sociocultural implications stimulating the emergence of political movements in the valleys under the leadership of, among others, the present premier, Mr. John Compton. An outcome of this movement was the attainment of political independence in 1979. The former sugar companies, however, especially Geest Industries, have retained their influence as shippers and marketers of the banana crop.

The transition to bananas soon had an effect on the transmission of schistosomiasis. The removal of the virgin forest cover, the expansion of the drainage system, and the more intensive interaction by human populations with newly created habitats, must have led to a rapid growth and spread of populations on the intermediate host, Biomphalaria glabrata. Direct evidence for this, especially in the Richefond Valley, is largely epidemiological: the incidence of infection was especially high in surveys carried out by the Research and Control Department (St. Lucia) for the periods 1966-1970, after which control measures were introduced. There was then a sharp decline in these infection rates, especially the mean number of worm pairs by the population.

During the latter part of the 1960s and 1970s the rate of growth of the banana industry slowed down considerably. This was especially noticeable as expressed in the gross figures for banana production, but also in the reduced number of small growers now involved in the industry. Roseau and Cul-de-Sac, two of the former sugar valleys, drastically reduced the area under cultivation and the number of employees on the plantations. On the other hand, in Richefond Valley the reduction was not as great. Surveys in the valleys suggest that the snail populations had declined considerably in the early 1970s. This decline coincided with control measures, and it is difficult to assess exactly the full impact on transmission. It is clear, however, that this trend reinforced these measures and led, ultimately, to the virtual cessation of transmission, especially in the Roseau and Cul-de-Sac valleys.


1000'
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ADDITIONAL AREA OF CULTIVATION 1971 (BANANAS)
SUGAR LANDS 1956
50'
DENNERY
ATLANTIC OCEAN
1:4167

RICHEFOND VALLEY, 1956-1971

FIGURE 1

## Control Measures

Between 1969 and 1981 the Research and Control Department of St. Lucia, in collaboration with the Rockefeller Foundation, undertook a program of control in three major valleys. In Richefond a water supply supported by health education and community participation was instituted. A mollusciciding (killing snails) program was simultaneously undertaken in Cul-de-Sac. In the Marquis Valley, to the north of Castries, treatment was given to the population.[7] Because of the need to monitor changes in the water-related behavior of the Richefond population, detailed observations of water contact were carried out. The overall objective of the study was to assess the impact of single measures of control, and to make some comparison between them with respect to their efficacy.

Because of differences in the ecology and epidemiology of the three valleys, it is difficult to draw hard and fast conclusions about which method was most successful in reducing transmission and infection rates. But the introduction of water supplies in Richefond was probably the most impressive method if other considerations, such as the convenience of having a water supply and the improvements in the general level of sanitation are considered. After the initial three years, in which there were sharp reductions in _S. mansoni_ infection as well as water contact, the population in this valley was also treated. The incidence, prevalence, and intensity of infection is now very low (from 60 percent then to 5 percent now). Other benefits, such as electricity introduced to pump the water but now used for other household purposes, have helped in transforming the social and cultural life of the people in the Richefond Valley. There has been a marked improvement in housing, education and transport over the past two decades. This is due, in part, to governmental measures, but also to increased income derived by the small grower from banana production. An important innovation has been the introduction of public laundry units and bathrooms, and as a consequence most of rural St. Lucia now has access to piped water. The exposure to schistosomiasis is much lower. Some "pockets" of transmission remain, but overall there has been a dramatic reduction in _S. mansoni_ infection rates.

Some critics have argued that this success story' of control measures in St. Lucia may be unique, and cannot be easily duplicated in larger developing countries. I disagree with this assessment. Conditions in rural St. Lucia during the 1950s and 1960s resemble conditions, for example, in parts of eastern Africa, if looked at in terms of human ecology. The relationship between human settlements and water bodies in Machakos, Kenya (where I am currently involved in a similar study), as well as the kind of health problems that arise from this relationship, have some striking parallels. This is illustrated in the schematic diagram of the various sub-systems involved in the expansion, sustenance and decline of schistosomiasis in St. Lucia from 1950 onwards (Figure 2). While this is meant to be descriptive of St. Lucia, it could with some modification be used as a model for many of the village settlements in Machakos, with the exception that coffee is the main cash crop.

I have arranged the sub-systems hierarchically, bearing in mind, however, that this tends to oversimplify the complex relationships that exist between the various sub-systems. The manner by which they interact should be set in a dynamic framework, as is illustrated in Figure 3. Bearing this in mind, the diagram is useful in providing a check list of the sub-systems involved, and of some of the most important interrelationships.

Vertically, the sub-systems have been divided into two main spheres, "Domestic" and "Economic." While these spheres inevitably overlap, they tend to fall into two natural groupings. This perhaps reflects a "dualistic" schism between subsistence agriculture on the one hand, and on the other, "plantation" society and all that this entails sociologically. Horizontally, the structural systems have long term and pervasive effects on the total picture. Thus, in the domestic sphere, systems of kinship, marriage, and descent play a role in influencing the type of household structure, and thereby the way domestic activities have been organized, as well as the size and distribution of landholdings. These activities impinge on the various types of interaction with local water bodies. For example, in St. Lucia, households in the villages tend to be clustered along roads usually running parallel to a stream. This clustering is based partly on kin, family and marital relationships, especially the bonds between mother and daughter and sisters, who, with their spouses, form households in close

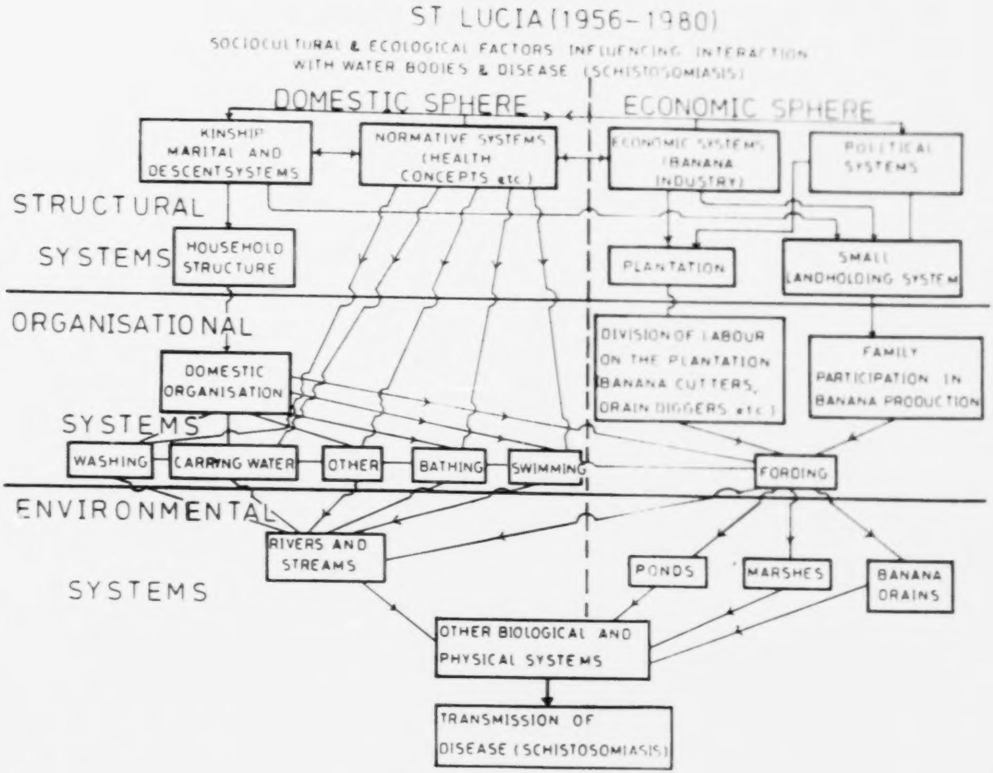

ST LUCIA (1956-1980)
SOCIOCULTURAL & ECOLOGICAL FACTORS INFLUENCING INTERACTION WITH WATER BODIES & DISEASE (SCHISTOSOMIASIS)
DOMESTIC SPHERE
ECONOMIC SPHERE
STRUCTURAL SYSTEMS
ORGANISATIONAL SYSTEMS
ENVIRONMENTAL SYSTEMS
KINSHIP MARITAL AND DESCENT SYSTEMS
NORMATIVE SYSTEMS (HEALTH CONCEPTS etc.)
ECONOMIC SYSTEMS (BANANA INDUSTRY)
POLITICAL SYSTEMS
HOUSEHOLD STRUCTURE
PLANTATION
SMALL LANDHOLDING SYSTEM
DOMESTIC ORGANISATION
DIVISION OF LABOUR ON THE PLANTATION (BANANA CUTTERS, DRAIN DIGGERS etc.)
FAMILY PARTICIPATION IN BANANA PRODUCTION
WASHING
CARRYING WATER
OTHER
BATHING
SWIMMING
FORDING
RIVERS AND STREAMS
PONDS
MARSHES
BANANA DRAINS
OTHER BIOLOGICAL AND PHYSICAL SYSTEMS
TRANSMISSION OF DISEASE (SCHISTOSOMIASIS)

FIGURE 2

proximity. The clustering of houses has influenced the selection and use of water contact sites in nearby rivers and streams, an important reason for the focality of transmission.[8] The division of labour within the household also traditionally affected the kind and intensity of activities at these sites, and therefore the level of water contact for the different age and sex groupings. This gave rise to variations in the relative risk of acquiring an S. mansoni infection, largely explaining the rise and fall of water contact and prevalence rates, although factors such as immunity must be taken into consideration with respect to the mean worm-burden. Normative systems also played a direct role in influencing these kinds of activities. Beliefs about the environment regulated the interaction of the population with it. For example, among St. Lucians there is a widely held belief that to come into contact with anything "cold" while the body is "hot" could lead to illness. Consequently individuals would avoid coming into contact with water bodies in the early morning hours, and human activities would rise to a peak at midday. As this was the period when the larvae were most active, this belief probably increased the risk of infection quite considerably.

In the economic sphere the capital inputs and the subsequent effect on the ecology -- especially the construction of banana drains and the clearing of large tracts of virgin bush, which provided more nutrients for the snail populations -- contributed to an upsurge in transmission and extra contact with water bodies by workers. Here the type of water contact was different than in the domestic sphere (which primarily involved washing clothes, bathing, etc.) Workers had short exposures, such as fording streams. But the increased movements of people in the smaller tributaries and streams, and the subsequent deposition of more fecal material, probably increased the infection rates of the snail population and the contamination levels of streams, and of larger rivers to which the snails could be transported. By the same token, the decline in the banana industry in recent years has probably reduced transmission by reducing contamination levels and water contact, particularly in work situations.

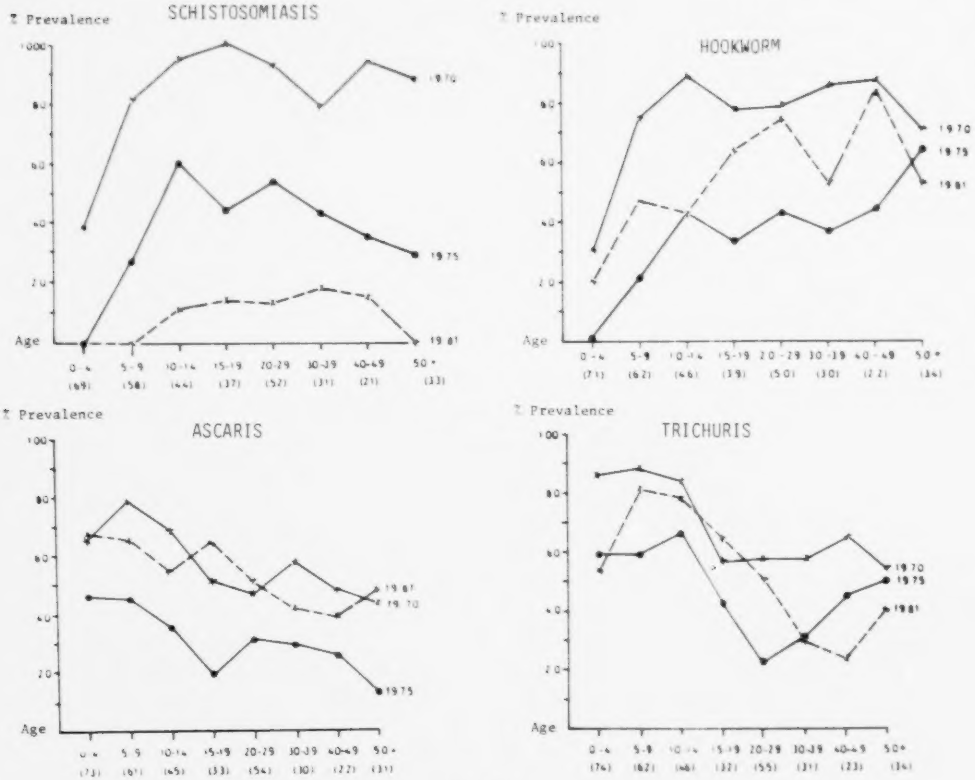
The control measures introduced in St. Lucia after 1968 involved some manipulation of the above sub-systems. Thus, a health education and community participation program had a marked impact on relevant health beliefs and practices of the population. The introduction of water supplies also changed domestic routines and the subsequent interaction of the population with nearby rivers and streams. It probably had little effect, however, on the contact of people involved in banana production. On the other hand, in the economic sphere the reduction in the capital inputs, and some important political events, especially in the latter part of the 1970s, had a dampening effect on the banana industry. The area of land under cultivation decreased, reducing the intensity of water contact in snail habitats (such as banana drains). In this sense, both the "control" measures and the unintended consequences of changing economic activities contributed to a reduction in S. mansoni infection and the consequent improvement in health. It is not clear exactly how much weight must be given to the "conscious" and "unconscious" factors influencing this attempt at control.9

## The Health of the Population in the Late 1970s

The reduction of transmission both stimulated and accompanied an improvement in the health of rural St. Lucians in the 1960s and 1970s. Whereas in the three valleys both prevalence and intensities of infection had been high (ranging from 40-60 percent of the total population), they were reduced to single figures (see Figure 3). Other parasites were also reduced during this period, both as a result of a treatment program by the Research and Control Department, but also because of socioeconomic changes. Hookworm, for example, declined, probably due to an overall improvement in sanitation levels, and also to an increase in attendance at school (where most children wore shoes). The reduction in the level of other parasites, such as ascaris, was less impressive.

A questionnaire and survey carried out at Grand Ravine, a village of 350 in the Richefond Valley, which I studied intensively, suggests that the total number of complaints, when compared with a "pre-control" survey, had dropped significantly. It must be borne in mind, however, that it is difficult to assess the relationship between schistosomiasis and various symptoms because of multiple influence from a wide variety of factors.10

Figure 4 shows how changes in the health of a population can play a role in regulating transmission. The debilitation of a population, in combination with other parasitic infections, could conceivably lead to a reduction in infection rates. In the



SCHISTOSOMIASIS

HOOKWORM

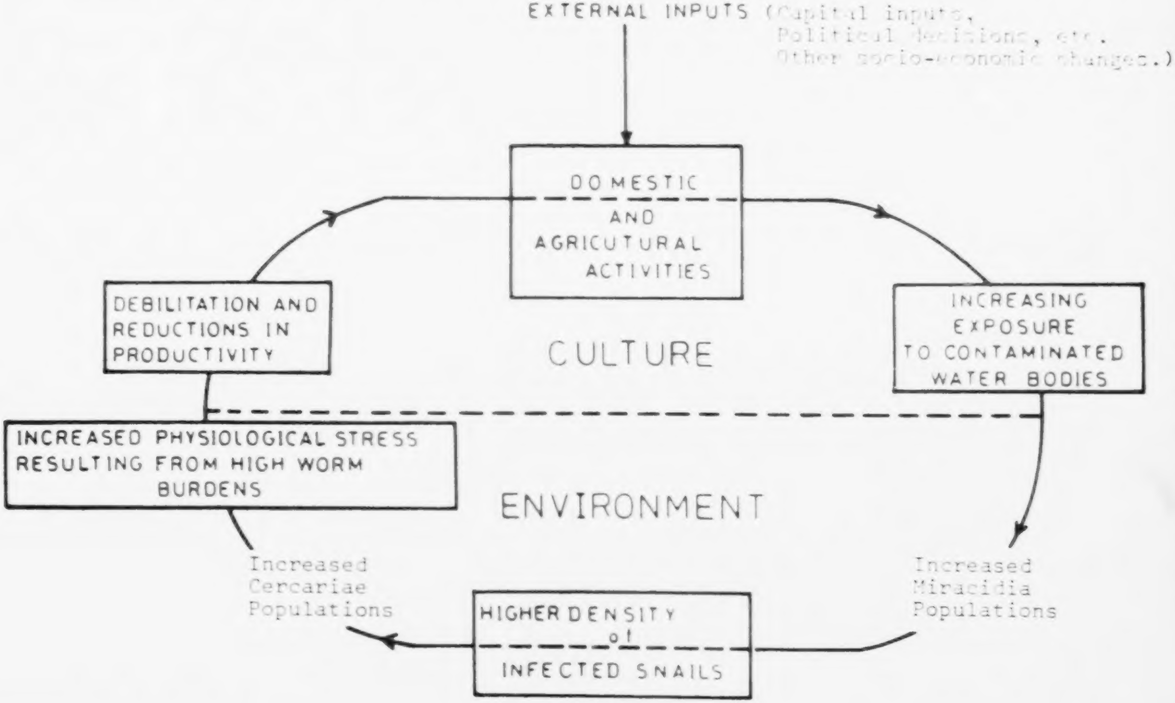
ASCARIS

TRICHURIS

FIGURE 3

FIGURE 4

DYNAMIC MODEL OF SCHISTOSOMIASIS MANSONI TRANSMISSION SHOWING 'FEEDBACK', RELATIONSHIPS BETWEEN SOCIOCULTURAL FACTORS AND THE ENVIRONMENT


EXTERNAL INPUTS (Capital inputs,
Political decisions, etc.
Other socio-economic changes.)
DOMESTIC AND AGRICUTURAL ACTIVITIES
INCREASING EXPOSURE TO CONTAMINATED WATER BODIES
DEBILITATION AND REDUCTIONS IN PRODUCTIVITY
CULTURE
INCREASED PHYSIOLOGICAL STRESS RESULTING FROM HIGH WORM BURDENS
ENVIRONMENT
Increased Cercariae Populations
Increased Miracidia Populations
HIGHER DENSITY of INFECTED SNAILS

case of schistosomiasis the effect may not be great as it requires only a small number of infected persons contaminating sites to sustain transmisssion. Studies on the effect of productivity in the banana industry have not been conclusive to date.[11]

## Conclusions

Disease processes in a human population are often intimately linked with a wide cross-section of human activities. This is especially the case with water-borne diseases such as schistosomiasis, which are often impediments to the socioeconomic growth and development of a population. Much more needs to be known about the sociocultural factors associated with these health problems before, as well as after, undertaking new, often hazardous water schemes (for example Lake Volta in Ghana). The relationships between the various sub-systems in this disease process are complex, and in this paper I have only touched lightly on these. The same kind of "system analysis" could, however, be applied to many other disease entities (e.g., malaria).

With intensified food production arising from the pressures of population, water schemes in developing countries are now accelerating. These are accompanied by growing risks of infection from water-borne diseases for increasing numbers of people. Not only will more persons be at risk, but the mean intensity of infection will almost certainly rise; this will lead to increased morbidity and mortality for those who are in constant contact with contaminated water, notwithstanding the development of acquired immunity, or even the discovery of vaccines for schistosomiasis and other diseases. Detailed micro-analyses of the total socio-ecological picture, as presented here, must become mandatory if decision-makers in the field of public health are to make an impact on health problems arising from the pressures of population growth in developing countries.[12]

NOTES

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# MATERNAL-CHILD HEALTH AND GANJA IN JAMAICA

MELANIE C. DREHER

School of Nursing
University of Miami

Until quite recently, marihuana smoking has been, almost universally, a male-dominated activity. Ethnographic studies of cannabis use in non-Western cultures (Rubin 1975; Rubin and Comitas 1975; Carter, Coggins and Doughty 1976; Soueif 1976; Hamid 1980; Dreher 1981, 1982), as well as survey findings in Britain and North America (Evans, Stevens and Samuel 1974; Roseberg, Kase and Berberian 1974; Blackford 1973; Galli 1974; Abelson and Fishburne 1976; Johnston, Backman and O'Malley 1977; Linder, Lerner and Burke 1974; Pandian 1977; Kandel, Single and Kessler 1976), document that historically men have been likely to smoke marihuana sooner, more frequently and longer than women.

The early anthropological studies in Jamaica, as well, focused on cannabis, or "ganja", smoking as a working-class, male social activity (Rubin and Comitas 1975; Dreher 1982). At that time, the female cannabis smoker was rare (particularly in rural communities), and even those women who cultivated and sold marihuana refrained from smoking the substance. Instead, they prepared and consumed it in teas or "tonics", a form of consumption which crossed the socioeconomic, age, and sex lines which ordinarily guide the normative use of cannabis in Jamaica.

Now, even to the casual observer, it is obvious that more and more women have begun to smoke ganja in a manner not unlike that of men. Estimates given by informants of the proportion of women in their rural communities smoking ganja ranged from 15 to 50 percent with the majority hovering around the higher figure (Shapiro 1983). Moreover, many women are smoking ganja throughout pregnancy, during labor, and into the breast-feeding period. As the use of ganja continues to increase among women of childbearing age, the extent to which this constitutes a public health problem in Jamaica is still undetermined. In Jamaica, as in North America, cigarettes, alcohol, and marihuana are the most commonly used drugs during pregnancy. The deleterious effects of alcohol and cigarettes on the fetus and newborn have been well substantiated. In comparison, studies on the consumption of marihuana and its derivatives during pregnancy and the lactation period are relatively few even though it is now known that THC (tetrahydrocannibinol) crosses the placenta barrier and has been traced in the mammary glands and milk of lactating women.

Medical research on perinatal cannabis use has been designed to investigate the possible harmful effects of cannabis smoking during pregnancy on the mother or infant. Included in this research are studies linking cannabis use to neurological abnormalities (Fried 1980), maternal weight gain, duration and progress of labor, meconium staining (Greenland et al. 1982), major malformations, length of gestation and low birth weight (Hingson et al. 1982; Linn et al. 1983). The results of these studies, however, have been largely inconclusive and often conflicting, primarily because of the inability to control for and explain socioeconomic and contextual variables. The marihuana users in these studies generally have lower incomes and education, are more likely to represent a minority culture and consume more alcohol and tobacco, and have poorer health habits than non-users; consequently it is difficult to distinguish the effects of cannabis from the many other variables that could influence the outcome of pregnancy. Clearly, clinical findings are extremely difficult to understand unless they are interpreted in relation to other lifestyle characteristics of the subjects. Yet there are still no published studies that have examined patterns of perinatal marihuana use and subsequent neonatal behavior vis-a-vis the sociocultural context in which they occur. The study reported here, currently underway in Jamaica, has attempted to come out of the clinical setting and examine the practices and beliefs surrounding perinatal ganja smoking through interviews and direct observation in community-based field sites.

The current study on cannabis, pregnancy, and neonatal health, is modeled on the original Jamaican ganja study conducted by Rubin and Comitas (1975). It combines (1) a clinical investigation that compares the newborns (up to the age of three months) of thirty cannabis-using women with those of thirty non-using women and (2) an ethnographic field study carried out in three rural communities, selected for their representativeness and comparability. The inclusion of an ethnographic component is based on the assumption that before we can understand all the biomedical ramifications of perinatal ganja use, it is first necessary to determine the social context of use: who are the ganja-using women, what roles and statuses do they occupy in their communities, and what features distinguish them from non-smoking women?

## Ganja Use by Women

Ganja is not new to Jamaican women. Their longstanding involvement in the preparation of marihuana teas and medicines has already been mentioned. Moreover, like their male counterparts, they likely were exposed to ganja through the ingestion of teas and tonics as infants and small children. Subsequently they may have experimented with smoking ganja in their teenage years. However, Jamaican females traditionally have been excluded from the adult recreational and work group gatherings in which cannabis is routinely exchanged and smoked. This exclusivity, based on gender, was rationalized by the widely held belief (at least widely held among male users) that women "don't have the brains" for smoking and should restrict smoking to no more than occasional use and only in the company of their mates. Men who were themselves ganja smokers, and even those who claimed to prefer a women who would "take a draw" now and then, nevertheless disapproved of the woman who attempted to smoke socially with her peers as men do with theirs.

The rare women who did smoke socially often were regarded as "brawling" and unrespectable. The importance of respectability as a guiding theme in the behavior of the rural West Indian women is grounded in economic considerations. For young working-class women, there are few opportunities for social advancement on their own. Typical female occupations, such as shopkeeper or seamstress, require a capital outlay that is beyond the reach of most young women. In addition, the time and energy requirements of tending to infants and small children interfere with their ability to work routinely outside the home. For such women, marriage - either legal or common-law - has been the primary means by which they can accumulate wealth and advance their status. The extent to which a young woman conforms to standards of respectability has traditionally influenced her success in acquiring and keeping a young man who is a cut above the rest--literate, steadily employed, perhaps even a civil servant. Since the competition for such men is intense, the woman who ignored the sex-linked injunctions on peer group ganja smoking risked sanction through censure and gossip by smokers and non-smokers alike. Moreover, she could be severely rebuked by her mate even though he might smoke regularly himself and require her to smoke with him in a pre-sexual context.

Despite this normative framework militating against female ganja smoking, research carried out in the late 1970s (Dreher 1984) revealed a dramatic increase in the number of women who smoked marihuana. A major factor in this increase was the exponential growth of Rastafariansim. As participating members of the religion, Rastafarian women are not only permitted to smoke ganja, but are expected to do so in order to fulfill their religious obligations. While they do not match the quantity and frequency of ganja consumption by their male counterparts, Rasta women ordinarily smoke on a daily basis and would be considered chronic users by any U.S. standards. Meanwhile, ganja exchange and use among non-Rastafarian female peers had also increased dramatically. For some women, the sharing and smoking of ganja had begun to acquire social value as an overture and confirmation of friendship and mutual assistance. Female smoking was still more sporadic and attenuated than that of men, but nonetheless approximated the peer-oriented social smoking typical of their male counterparts.

Interestingly, despite its initial concentration in Kingston and other cities, the diffusion of female ganja use did not radiate evenly from the urban centers. Instead, it flourished in some communities and not in others. Research conducted in the late seventies (Dreher 1984) on these inter-community differences permitted us to trace the variance in entry of women into a traditionally male activity and to speculate about the type of setting in which women are likely to breach norms and engage in what is traditionally considered male behavior. It appeared that female ganja smoking tended to concentrate in communities where women had access to their own income-generating activities independent from their mates. Thus, in the densely populated neighborhood-communities surrounding a large sugar estate, female ganja smoking was more prevalent than in the hill communities where small farming is carried out by family and household units.

In the sugar estate communities the presence of top management families provided domestic work for the older, more established women of the working class. However, the presence of many unrelated men who migrated to the area seeking work probably offered the single greatest source of remuneration for the domestic, marketing and sexual services of the estates' working-class women. Because women had this capability of generating cash, irrespective of their "baby father", they had the option of remaining in or returning to their parental homes, or even maintaining their own households, if a union foundered. As one young woman explained, when she and her boyfriend quarrelled and separated, she took her children to eat in her father's yard one day and her mother's the next; a male friend "visited" her twice a week, gave her twenty-five dollars, and bought her a new dress. Added to her own money that she earned from washing and ironing for a school teacher, she was financially better off than she was before her boyfriend left. Also, because of the large number of single, unrelated males residing in the area, she was not disqualified from a new relationship after the failure of past ones. While such women were not opposed to a stable union in which they and their children were supported by a steadily employed male - indeed, this was probably the ideal for most- they also were cognizant of their own abilities to establish new unions quickly as well as to generate income and support their children independently of any one man.

This economic independence permitted these women a greater degree of social independence (though not necessarily greater wealth) than that enjoyed by women in the hill communities where female ganja smoking was still rare, even nonexistent. There, except for occasional agricultural wage labor, the working-class woman's productivity was organized around her own household unit. She took care of her own children and grandchildren, cooked, cleaned, and washed for her own family, marketed household produce, and as her children grew older and required less care, she cultivated household lands and tended household stock. While all these efforts were income-generating for her family unit, very few activities provided direct cash reward for the woman herself. This is not to say that women would not have performed any or all of these activities on a cash basis if such opportunities had been available. The fact is that such communities are composed mainly of other corporate households. Without special skills and without a market for ordinary skills, the socioeconomic viability of the hill woman was inextricably connected to the corporate household. Her limited options for earning an income, and her greater reliance on local men, increased her vulnerability to social censure. Thus, there was an unequivocal pressure for such women to discontinue the practices they may have enjoyed in adolescence, and adhere to the societal norms of male spiff smoking and female tea drinking.

Now, five years later, women who smoke ganja are not only grudgingly tolerated, but they have been given the commendatory title of "roots daughter". This term of praise and esteem is used to signify the woman who has "good brains", who can smoke as hard as a man, and with whom men can "reason" as they would with other men. The model roots daughter is not simply a ganja smoker, she is also a woman of dignity. She "must live up to principle," "go about properly," and "keep a standard." If the roots daughter is involved in a stable union, her partner can expect her to be obedient, helpful, and sexually faithful. As one informant explained, if you see a roots daughter talking to another man there is no reason to be jealous because "it nah mean anyt'ing".

Economic independence is another characteristic of a roots daughter, who often describes herself as a "worker", a "fighter", a "woman with a plan". She compares herself favorably to "lazy" women who don't smoke weed but "sit down an' wait fe some man to help 'dem". This economic independence from the opposite sex is played out in a variety of ways. Some of the single "roots daughters" have quite realistically assessed the extent to which they can rely on any one man and have concluded that they are better off on their own with several male "friends". As one popular shop owner proclaimed when asked whether she had a boyfriend, "me nah bother wi' dat t'ing...dem ha' nuttin' fe gi' me" [I don't bother with that...they have nothing to give me]. Another heavy ganja smoker in the process of building her own house, similarly dismissed men as providers saying, "after you reach forty dem nah wan' you again...then you're in no man's land...it more better to have your own house when you reach old age." (She was not yet forty.) Both admitted, on the other hand, that they were not adverse to occasional sexual encounters but tended to treat them almost playfully, as another source of revenue, useful when a lump sum of money is needed to buy seeds for a cash crop or pay a monthly installment on the shop freezer. In general, the ganja smokers were more sensitive to the economic marginality of men in their localities and candid about their multiple relationships. As one mother of three children explained, "If I don't have two men, I don't wear clothes." The difference between a roots daughter and other women is that the roots daughter, unless engaged in a stable union, makes no pretense of faithfulness and dependence.

One of the more remarkable findings of the study, thus far, is that none of the seventy female ganja smokers who were interviewed as part of the ethnographic component of the study (including over forty currently engaged in a stable union) identified themselves only as housewives or homemakers. Whether by necessity or preference, all had additional sources of income. These included farming, shopkeeping, rental property, raising livestock, but often they supported themselves and their children through the sale of ganja - either regularly or sporadically. In practically all cases, the women who smoked ganja had greater sources of income than their non-using counterparts and were more effective in providing food, clothing, and shelter for themselves and their dependents.

## Ganja Use During Pregnancy

What does all this mean for understanding perinatal ganja use, and what is the significance of ganja consumption for the pregnant women in rural Jamaica? It became clear from the interviews that women are well aware that ganja may be harmful to their babies. Warnings from the "old people" about babies born "viled up" with "black mouths", "mashed-up brains", and "cracked skin" were reinforced by nurses and midwives who counseled that their babies might be slow and weigh less. Yet, of the seventy smokers who were interviewed in the ethnographic studies, only eleven discontinued smoking during their pregnancies. Of these eleven, eight shifted to using ganja tea instead. One woman claimed to smoke only when pregnant.

Rastafarian women are motivated to continue smoking ganja during pregnancy because the health-rendering and spiritual properties of ganja are clearly a part of their doctrine. For the others, it is tempting to suggest, as do many of the midwives and public health officials, that they simply place greater value on the immediate pleasure derived from recreational ganja smoking than on the health of their babies. Indeed, most often mentioned by these women was the psychologically uplifting role of ganja during pregnancy:

> "It helps me forget problems"
> "It keeps you lively"
> "When you have a problem it cuts it off from your"
> "When feeling down-hearted me use it fe cheer up me spirit"
> "It mek me feel nice"
> "Smoking mek me feel more comfortable"

Such comments, which appear at first to suggest that women are willing to place their babies at risk for personal gratification, need, however, to be examined in the context of the indigent communities where poor and working-class women live out their daily lives. First, the majority of pregnancies which occur in such environments are not celebrated. Only two of the sixty women in the clinical component of the study had actually planned their pregnancies while the vast majority received the news that they were pregnant with varying degrees of enthusiasm. Although pregnant women theoretically occupy a special place in Jamaican society, in reality, among the poorer social sectors, only the primigravidas are treated with deference and pampered to some degree. For the woman expecting her third or fourth child, another pregnancy simply increases her existing burden. She must continue to care for her children and meet her usual housekeeping responsibilities, but now with the added dimensions of fatigue and nausea. If she is wage earner, she may be required to discontinue her job and it is unlikely that she will have the opportunity to resume it after the baby is born. While the "baby father" is expected to provide support for the "baby mother", unless he resides in the same household, his contributions are seldom sufficient to cover the loss of her income and the expense of even a modest layette.

While the primigravida may be in a somewhat more advantageous position, an unanticipated pregnancy sometimes signals a drastic change in life plans. One participant in the study had already enrolled in a practical nursing school when she discovered she was pregnant, and she remained despondent for most of her pregnancy. Eleven of the adolescent participants were required to leave secondary school, with no opportunity to return. While these younger women were, in general, more enthusiastic than the multiparas about being pregnant, many lived in households in which they had to face the disappointment and criticism of their families on a daily basis, particularly if the "baby father" did not "own" the baby or provide any financial support. Three were told to leave the parental homes, although two of these were eventually permitted to return before the birth of their babies.

At the same time that the burdens are increased, the pleasures are withdrawn. Almost all of the sample reported that when their pregnancies became obvious, they discontinued going to parties, dances, bars, shows, and even to church or any other form of social activity. The depression that accompanies an unwanted pregnancy (for many, another unwanted pregnancy) in a fragile economic environment, where access to resources is unpredictable at best, is not trivial. The role of ganja in providing a brighter outlook may need to be reassessed, not as a recreational vehicle of escapism but as a serious attempt to deal with the most difficult social, psychological, and physiological circumstances.

Loss of appetite, nausea, and fatigue further compound on "bad feelings" that women commonly reported. For many women, ganja was seen as an option which provided a solution to these problems. For example, of the sixty-seven women who continued to consume ganja during pregnancy, twenty claimed that it increased their appetites and allowed them to eat during pregnancy. Sixteen reported using ganja to control the nausea and vomiting typically found in the first trimester. Fatigue was also routinely cited as a common complaint by both smokers and non-smokers and thirty-one women reported using ganja for that purpose. According to these women, "ganja keeps you working", "gives you strength," and "makes you work better". Twelve more said they used ganja to help them sleep better and relax. For women who are responsible for the full support of their household, these are important considerations.

Since the thalidomide mishap, there has been considerable public concern over protecting the unborn child from exposure to substances with potential adverse side effects, and the medical establishment's hard-line approach to the ganja-smoking mother is understandable. However, even these preliminary data from Jamaica suggest that if there is a problem, it is considerably more complex than straight pharmacological or medical research would suggest. It is obvious that ganja use during pregnancy is profoundly influenced by the social context in which it occurs, and thus requires a carefully constructed risk/benefit analysis that would allow us to examine not only the potential hazards but also the relative merits of ganja for both the mother and baby. This is a substance which a number of mothers believe increases their food intake by enhancing their appetites and relieving nausea during pregnancy. It permits them to accomplish necessary child care responsibilities and household tasks, assures sufficient rest, and provides psychological consolation. Indeed, one might hypothesize that ganja-using women may actually have a reproductive advantage over non-using women (1) because they have a potential solution to many common complaints of pregnancy (nausea, fatigue), (2) because selling ganja provides a source of income that does not require strenuous labor out of the home, and (3) because ganja use by women tends to be correlated with greater economic security. In any case, the particular status and role of a woman in her community profoundly affects her health and the health of her offspring, in part by influencing her use of ganja.

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# HYPERTENSION AND CULTURE CHANGE IN THE CARIBBEAN

WILLIAM W. DRESSLER
College of Community Health Sciences
The University of Alabama

Essential hypertension, or chronically elevated arterial blood pressure, is an epidemic of the modern world. The disorder afflicts approximately 20 percent of the population in developed societies and is a major risk factor for coronary heart disease and cerebrovascular disease. The prevalence of the disease and associated excess mortality is even greater among members of particular ethnic groups, persons with less education, and persons with lower occupational status. This high prevalence of hypertension in developed societies is quite distinct from the picture presented by more traditional societies. In traditional societies the prevalence of hypertension rarely exceeds 5 percent, and the disorders associated with hypertension have a correspondingly low prevalence. Hypertension is thus part of an epidemiologic transition that accompanies the process of modernization and development; as societies modernize the prevalence of hypertension and related cardiovascular disease increases (Dressler, 1984).

Caribbean societies, like other societies undergoing culture change and modernization, show an increasing prevalence of hypertension. Table 1 shows mean levels of systolic and diastolic blood pressure for various Caribbean societies, for North American black people, and for North American whites. Also shown are the percentages of persons with hypertension in each group.1 Mean levels of blood pressure and the percentage of persons with hypertension are higher among persons in West Indian societies than among either North American group. This high prevalence of hypertension is reflected in mortality figures as well; cardiovascular disease is among the leading causes of death in the Caribbean (Grell, 1983).

The important question, from both a theoretical perspective and an applied perspective, is: what in the process of modernization causes the increase in the prevalence of hypertension? The answer to this question should both teach us something fundamental about the modernization process and suggest ways for preventing the increase in mortality from cardiovascular disease that is a part of the process.

Traditional risk factors for hypertension include heredity, obesity, high salt intake, low physical activity, and increasing age. These factors have been hypothesized as mediators of the modernization-hypertension relationship: i.e., modernization leads to changes in diet and physical activity which in turn cause hypertension. However, empirical research has shown that there continue to be higher blood pressures in more modernized societies even after these factors have been controlled (Waldron, et al., 1982; Dressler, 1984). This finding has led to the hypothesis that modernization is stressful and that it is this stress which leads to higher blood pressure (Eyer, 1975). A great deal of research has examined this question (reviewed in Dressler, 1984). It is clear that there are sociocultural factors that both increase and reduce the risk of hypertension in the process of modernization; however, there is as yet little understanding of the precise factors involved or of the specifics of the process. Modernization in the Caribbean and the documented high rates of hypertension there create a useful situation for the examination of the stress of culture change and the contribution of that stress to high blood pressure.

The stress of culture change is not the only way in which modernization influences hypertension. As a society develops and the prevalence of hypertension increases, the treatment of the disease increases in importance. Hypertension places new

## TABLE 1

### Mean Arterial Pressure and Prevalence of Hypertension in Caribbean Populations (By Sex and 40-49 Year Age Groups)

MALES

| | Systolic BP | Diastolic BP | % Hypertensive |
|---|---|---|---|
| St. Kitts | 143.5 | 86.0 | 27.7 |
| Jamaica | 137.1 | 87.2 | 16.5 |
| Bahamas | 143.7 | 92.9 | - |
| St. Lucia1 | 37.9 | 88.3 | 36.4 |
| U.S. Blacks | 133.3 | 86.9 | 38.2 |
| U.S. Whites | 130.2 | 84.1 | 17.3 |

FEMALES

| | Systolic BP | Diastolic BP | % Hypertensive |
|---|---|---|---|
| St. Kitts | 154.9 | 90.6 | 44.6 |
| Jamaica1 | 47.3 | 89.9 | 24.5 |
| Bahamas | 151.2 | 91.5 | - |
| St. Lucia | 134.6 | 86.3 | 26.8 |
| U.S. Blacks | 129.8 | 84.6 | 28.3 |
| U.S. Whites | 123.5 | 80.0 | 10.1 |

demands on the health care systems of developing nations because it is a chronic disease. As such the disorder can only be controlled, not cured, and this control requires a fundamental change in an individual's behavior; at the very least, the individual must adjust to a life of self-medication. These new behaviors are influenced by cultural models of health and disease, or ethnomedical beliefs. The ways in which these beliefs relate to the treatment of hypertension, and the ways in which these beliefs are influenced by culture change, are an important component of a sociocultural perspective on hypertension.

In the remainder of this paper I will examine the process of culture change in one Caribbean society, St. Lucia, and the effects this process has had with respect to hypertension. First, the stresses associated with culture change will be examined in terms of the effects of blood pressure. Additionally, traditional elements of social organization in St. Lucia will be examined that protect individuals from the stresses of culture change. Second, variations in ethnomedical beliefs will be described and the effects of these beliefs on the treatment of hypertension will be presented. Finally, the implications of these results for future research and for the prevention and control of hypertension in the Caribbean will be discussed.

## Culture Change in the Caribbean

One difficulty with research on stress and culture change has been that the hypotheses concerning what is "stressful" about culture change have focused on simple changes in status factors (e.g., occupation, education), and not on the meaning that culture change has in particular settings. Stresses associated with modernization will vary depending on the specific sociocultural setting and on the specific process of modernization. In a stimulating essay Raymond T. Smith (1970) has summarized the main currents of culture change in the Caribbean, and while that paper is fourteen years old now, the major features of the process have continued essentially unchanged. Fundamentally this process has involved a change in the system of social stratification. Traditionally in the Caribbean there was a two-class system: a broad lower class of poorly paid workers and small farmers, who usually were black, and a small, wealthy, white elite at the top who were the large landowners. Since World War II there has been a shift in economic activities in the region. This has resulted in an increase in production in traditional and new export agricultural activities, an increase in the exploitation of natural resources, some industrialization, and an increase in foreign aid to the region with attendant increased expenditures on health, education, and social welfare (ibid:46-51).

The effect of these macrostructural economic changes has been to increase the differences within systems of social stratification in the Caribbean. As industrial and retail bases of the regional economy have expanded a new upperclass of managers and executives has emerged to replace the plantation owners. In the middle of the spectrum of stratification there is emerging a new class of white-collar workers and semi-skilled workers: persons with secondary school educations who are the bank clerks and operate small retail businesses at the village level, as well as trade school graduates who do the finish work in construction or are mechanics. The bottom of the class hierarchy continues to be the agricultural laborers, their industrial counterpart, the unskilled factory workers, and the broad group of semi-employed persons who get by through "scuffling" or "hustling". The lower-class groups just described continue to be the largest category, but the upwardly mobile middle-class group is a real force in West Indian society. Overall, this process has led to an increase in economic differentiation among households (ibid).

These changes in economy and the stratification system are the objective facts of the situation, but there is a strong symbolic element as well. Individuals do not simply occupy a particular status; they also manipulate symbols in an effort to project their own image of that status. These symbolic elements of stratification are what Weber and others (Gerth and Mills, 1946; Redfield, 1953; Smith, 1970) have referred to as "style of life". The life style of a group consists of the symbolic expression of what the good life is, of the aspirations to right and proper conduct. Smith (1970:72) argues that the process of modernization and the related life style change in the Caribbean is in essence a process of "Americanization". Writing of Puerto Rico as a case in point, he suggests:

> . . .in Puerto Rico "modernization" is closely bound up with "Americanization"; this is the case for most Caribbean societies, even in the absence of direct political ties, simply because of proximity and growing involvement in the hemispheric economic and

> communications systems. The image of the "admirable man" toward which everyone strives, each in his own way, is increasingly the man who lives the good life of mass consumption society in the way depicted by advertising agencies. Commercial television, films, and newspaper and magazine advertising all try to give a local cast to "the image" but it comes out basically North American.

Thus, the good life, the high status life, consists of attaining a high material consumption pattern similar to the North American middle class. All persons strive to attain this life style, but clearly members of different social classes will vary in their ability to satisfy those expectations.

This modernization process was precisely what I observed in my fieldwork in St. Lucia, one of the "small islands" of the Eastern Caribbean.[2] The economy of St. Lucia began to expand and grow in the years following World War II as a result of a single innovation - the introduction of the banana as a cash crop. As a result of the lower capital investment required for growing bananas, and because of trade concessions within the Commonwealth, an internal marketing board, and the introduction of a transportation system to reach overseas markets, the banana proved profitable. By the early 1960s, it completely replaced sugar as the main export (O'Neale, 1964; Weisbrod, et al., 1973:34-36; Dressler, 1982:21).

There was also an important cultural component to the introduction of bananas. Small-scale growers or peasants who before did not have sufficient capital to participate in the export economy could do so by growing bananas. Indeed, anyone with a small plot of land could grow a few "hands" of bananas and sell these through the local marketing board. While such activity may not be particularly lucrative, it is highly meaningful for the individual. No longer was the average St. Lucian shut out of the national economy, except through his labor input. Now the small landowner could be a full-fledged member of a modern St. Lucian culture. It was no longer the exclusive milieu of the elite (Glick and Glick, 1969).

With the expansion of the economy as a result of bananas, other growth occurred as well, including growth in manufacturing, tourism, and other sectors of the agricultural economy. The end result of the process was that, at least through the mid-1970s and the beginning of the recent inflationary-recessionary spiral, per capita income on St. Lucia grew at modest but consistent levels (Weisbrod, et al., 1973). It must be recognized that the greatest profits from this economic growth accrued to the socioeconomic elite; however, the entire mass of the St. Lucian population did benefit somewhat from growth, both economically and culturally.

The overall economic activity led to expansion of a middle-income or white-collar class. By amassing new resources, whether these were land, educational credentials, or capital from migration for work, these individuals were able to expand into new economic and occupational activities and hence become upwardly mobile. What was most striking about the expansion of this middle-income group was the new style of life that accompanied it. As described above for the region as a whole, new patterns of living, involving the acquisition of consumer goods such as televisions, imported furniture, appliances, and automobiles came to represent the success with which individuals in St.Lucia were able to achieve the new status.

## Culture Change, Stress, and Blood Pressure

This then is the process of modernization in the Caribbean, a process of increasing differentiation within the economy, upward economic mobility among segments of the population, and changing styles of life. The stressful aspects of this process were noted by Smith (1970:72) at the close of the essay cited above: "The techniques of modernization themselves may produce conflict if they result in the achievement of a high level of consumption by one segment of the population while others are frustrated in their aspirations." In applying this idea to the prediction of blood pressure, it was hypothesized that the individual who attempted to attain and maintain a style of life characterized by a pattern of high material consumption, but in the face of barely adequate or inadequate economic resources, would be under chronic stress.

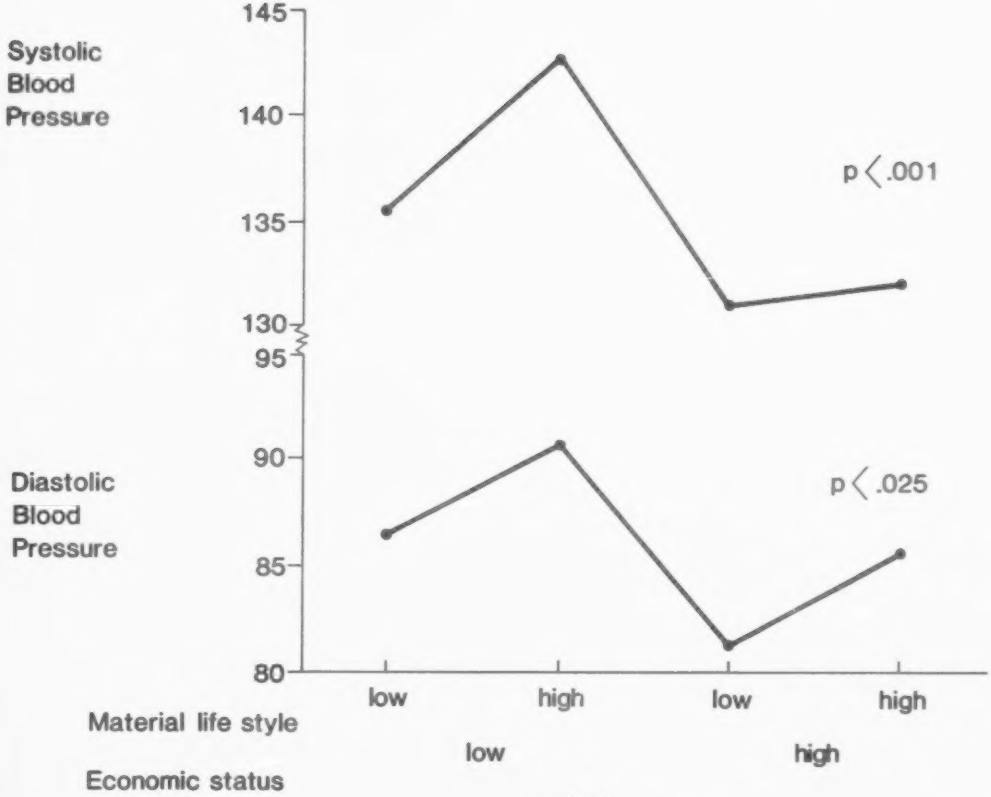
This stress would take several forms. The individual would be projecting an image of himself, based on the symbolic value of the material items he bought, as a successful, modern person, when in fact his economic background might not be consistent with that. As Smith (1970:46) notes, occupation in the Caribbean is a primary social identity. A person who is a laborer may, through migration, credit, or "hustling", be able to attain a particular life style, but this will be symbolically discordant with his occupational identity, which in turn would lead to unsatisfying social interaction. A second form the stress would take is in terms of the frustration and resentment felt by the individual striving for a particular life style but unable to achieve it. Finally, there is a behavioral component to the process, evidenced by the individual who might work two or three jobs and drive himself incessantly to achieve that life style. As a result of all these factors, the individual who attempts to attain or maintain this valued modern style of life, but who has inadequate economic resources, will have higher blood pressure. This can be referred to as "life-style stress".

These ideas were tested in a community survey of middle-age persons in a town in St. Lucia. Details of sampling, methodology, and blood pressure measurement are presented elsewhere (Dressler, 1979; 1980a; 1982). Style of life was operationalized as "material life style", an inventory of common consumer goods obtained by the individual. "Economic status" was measured by the ranking, generated by St. Lucian informants, of the individual's occupation in terms of both income and prestige. The relationships of these two factors to systolic and diastolic blood pressure (controlling for age and obesity) are shown in Figure 1. The persons with the highest levels of blood pressure are those with a high material life style and low economic status. These results strongly support the model of culture change and stress outlined above.

It is interesting to note the strategies employed by individuals to achieve a higher status style of life, even in the face of marginal economic resources. One of the most important of these is migration; one-third of the respondents had been abroad to work for varying lengths of time. This migration is strongly correlated with achieving a higher status style of life ($r = .42, p < .001$). A second, newer strategy for upward status mobility is to buy on credit using bank loans or credit extended by retail stores; 28 percent of the respondents used this strategy, which was correlated with a higher material life style ($r = .41, p < .001$) and with a higher degree of life-style stress ($p < .08$). A final logical alternative is to use one's social capital, or borrow through relatives and members of one's personal social network. Interestingly, this strategy is not used for this purpose. It is correlated with a lower

FIGURE 1

Arterial Blood Pressure inRelation to Economic Status and Material Life Style



material life style ($r = -.23$, $p < .03$) and with lower life-style stress ($p < .01$).

In sum, individuals use a variety of strategies to attain a culturally valued material style of life, but attempting to maintain that style of life in the face of inadequate economic resources, or what I have referred to as "life-style stress", is associated with higher blood pressure.

Does this mean that individuals who are able to satisfy their aspirations for upward mobility, both in terms of their economic resources and in terms of achieving a valued style of life, are free from stressors? Certainly not, but the nature of the stresses influencing the newly upwardly mobile differ markedly from those of the lower class. As argued above, lower class concerns revolve around aspirations to a style of life associated with modern status; the upwardly mobile class, having satisfied those social symbolic aspirations, shifts its concern to satisfying aspirations concerned with self. Modernization is not an exclusively technical process; it also involves changes in personality attributes, concepts of the self, and cognitive orientations. It is my contention that, in the process of modernization in the Caribbean, once material aspirations have been satisfied the concerns of the individual shift to these psychological matters, and therefore the stresses affecting that individual and his health become intrapsychic in nature. This argument is analogous to Aronoff's (1967) analysis of personality on St. Kitts in which he posits a hierarchy of needs, with concerns over self-esteem and self-actualization occurring under a different set of constraints from concerns over material needs.

A measure of "perceived stress" was developed that assessed the way in which individuals evaluated the impact upon them of a variety of life changes (see Dressler, 1984 for a detailed description of this measure). It is assumed that the individual who perceives common, culturally appropriate environmental events (e.g., birth of a child, change in conjugal status, death of a relative) as having a greater disruptive impact is under greater intrapsychic stress. Furthermore, it is hypothesized that this will affect blood pressure primarily among persons with higher economic status. These results are shown in Figure 2 and support the hypothesis unequivocally. Upper economic status persons who perceive higher stress in their lives also have higher blood pressures.

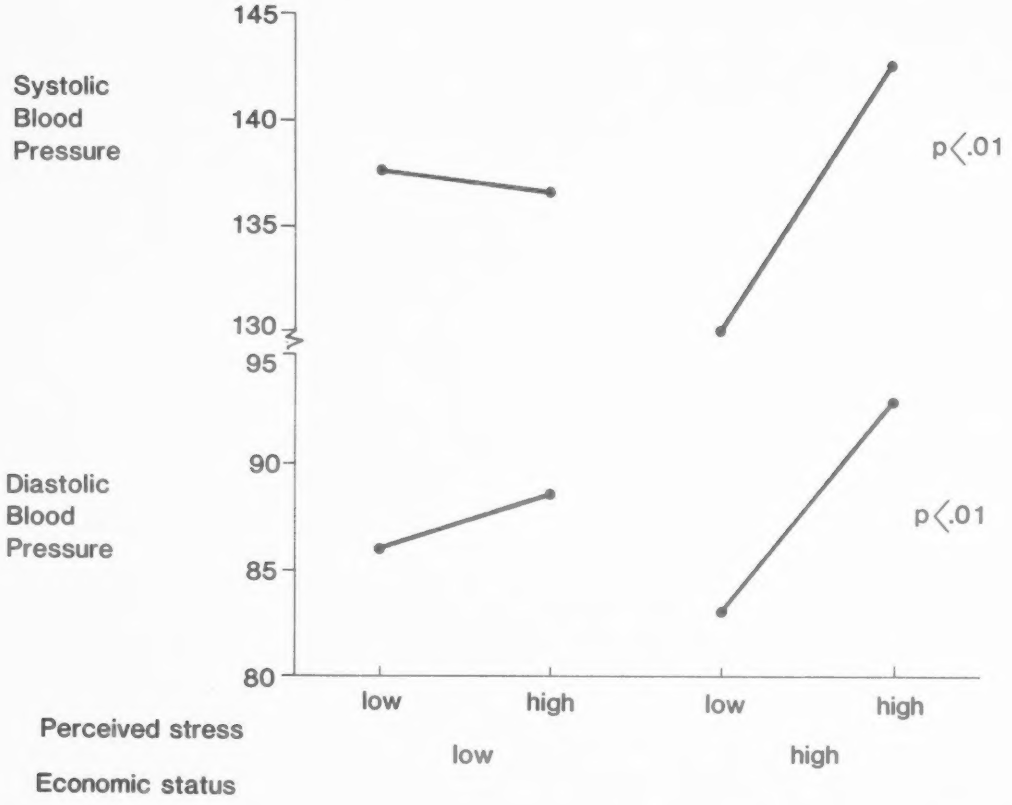


FIGURE 2

Arterial Blood Pressure in Relation to Perceived Stress by Economic Status

Thus far I have concentrated on sociopathogenic influences of culture change in the Caribbean, but it must be emphasized that there are dimensions of culture that help to protect individuals from the effects of stress, and which are conducive to better health. Social relationships that serve a protective function are referred to as "social supports", and value and personality characteristics that reduce the stress response are referred to as "coping styles". In St. Lucia, the major social supports are to be found in the context of the extended family. Recent analyses of the West Indian family have shown that the unique features of the family serve to link households into networks of cooperation, or what I have referred to as social support systems (Dressler, 1980a; 1982). This phenomenon of inter-household linkages has been noted by other researchers as well (Whitten and Szwed, 1970). In St. Lucia these social support systems are formed as a result of patterns of conjugal relationships (Dressler, 1979) and through extended kinship relationships, primarily among adult siblings (Dressler, 1980a).

A nonkinship-based form of social support may be found in individuals' participation in voluntary associations. In St. Lucia the associations of primary importance for support are the "friendly societies". These include mutual aid societies founded along religious or occupational lines to which members contribute monthly dues and in turn qualify for short-term benefits in time of acute distress. As culture change has proceeded, however, participation in life and health insurance plans has come to be substituted for the traditional "society".

A coping style traditionally of importance in St. Lucia is a direct-action coping style. This refers to the individual's propensity to openly and actively pursue solutions to problems in his or her life, rather than to passively and fatalistically accept stresses or to defensively avoid them. This distinction parallels the psychological differences between occupational groupings documented by Aronoff (1967). I found in St. Lucia that the direct-action coper was the more esteemed and valued ideal of an individual.

These four factors can be combined into a single dimension of "psychosocial resources", social relationships and values and personality characteristics associated with traditional St. Lucian culture that help individuals to resist the effects of stress, and hence should be related to better health status.

Figure 3 shows the relationship of this dimension to systolic and diastolic blood pressure, and in fact higher levels of these resources are related to healthier levels of blood pressure.

The effect of culture change in the etiology of essential hypertension in St. Lucia can be summarized as follows. Culture change has caused an increase in socioeconomic or social class differentiation within Caribbean societies. This differentiation has led to the growth of a middle-income group which emulates a North American style of life, so much so that this style of life has become the image or symbol of the "admirable man", to use Smith's (1970) phrase. The effect of this has been for all social class levels to aspire to this style of life, which is problematic for the lower class group that continues to make up the bulk of the population. Those individuals who, through a variety of strategies, attempt to maintain such a style of life, but without adequate income, are under stress ("life-style stress") and have higher blood pressures. The stresses affecting the higher class groupings are more a function of their perceptions of change and uncertainty in their environment, which is in turn related to higher blood pressure. These stresses of culture change can, however, be mitigated by psychosocial resources that help individuals to resist the effects of stress. These resources, which are traditional strengths of Caribbean culture, are related to lower blood pressure.

## Cultural Factors in the Response to Hypertension

Factors associated with culture change that increase or decrease the risk of hypertension are only a part of the total cultural context of hypertension. Once sociopathogenic processes have been established within a population there will of course be an increase in persons who require treatment. The treatment requirements for hypertension are problematic since hypertension is a virtually symptomless disease that can only be controlled with appropriate medication. This requires a lifelong change in a person's behavior, and one that is not easily established. In the U.S. it is estimated that of all persons who have hypertension only half have been identified; of those persons who have been identified as having hypertension only half take their medication with sufficient regularity to control the disease (Galton, 1973).

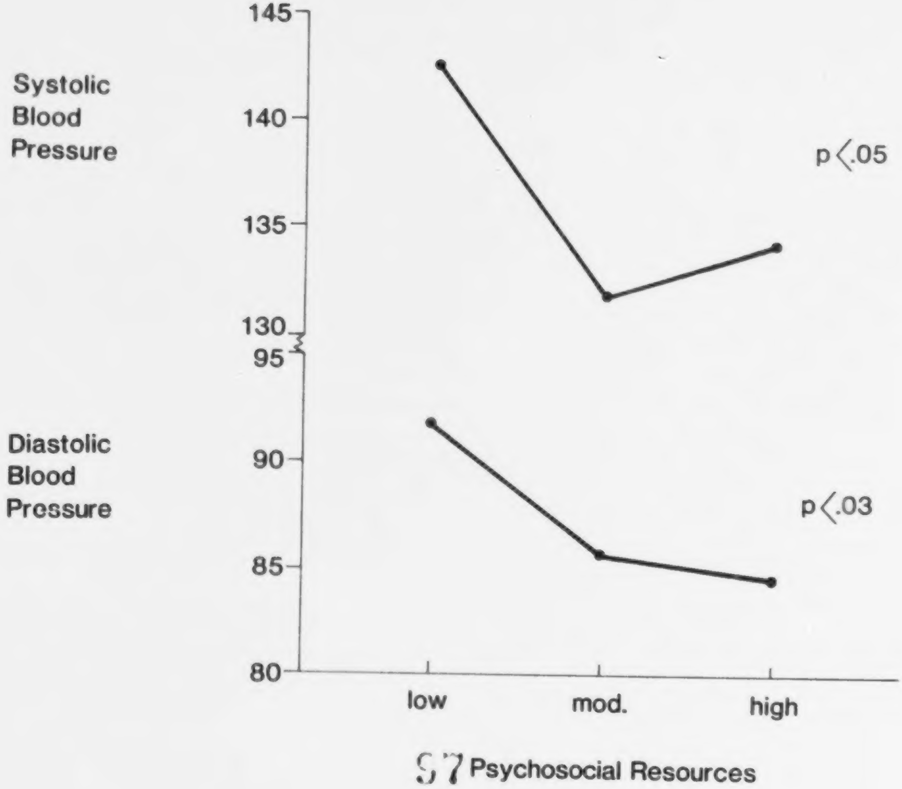


FIGURE 3

Arterial Blood Pressure in Relation to Psychosocial Resources

There are a variety of factors that influence whether or not a person complies with a therapeutic regimen, including the complexity of the regimen, situational factors of the treatment setting, and the nature of the physician-patient relationship. But as Watkins (1983) suggests, in the Caribbean setting major determinants of individual behavior with respect to disease are the beliefs about health, disease, and healing that are a part of culture. These are usually referred to as ethnomedical beliefs.

A number of anthropologists have noted the importance of cause or etiology as a defining feature of ethnomedical belief systems (Glick, 1967; Foster, 1976); that is, varieties of ethnomedical beliefs can be distinguished in terms of beliefs about the causes of illness, with beliefs about kinds of treatment, sources of treatment, course and severity of the illness, and individual responsibility for health, all deriving from beliefs about cause. In St. Lucia there are three varieties of ethnomedical beliefs. The first falls under the rubric of "obeah". Obeah is a system of witchcraft and sorcery. Obeah is not seen as a necessary or even sufficient cause of illness; however, these practices may be used to make any existing illness episode longer, more severe, and sometimes fatal. The obeah practitioner will use illness to incapacitate a victim for his or her own ends. If obeah is suspected in an illness, a "gade" will be consulted. This ethnomedical specialist has the power and knowledge to counteract obeah. An interesting aspect of this belief system is that it has not remained static, but rather new ideas concerning magic and the occult have been incorporated into obeah beliefs. These new ideas have come primarily from North American writers on the occult (Hogg, 1961; Dressler, 1980b; 1982).

A second belief system in St. Lucia is referred to as "bush medicine." In this system of beliefs, illness is thought to result primarily from natural forces -- variations in hot and cold, imprudent dietary practices -- rather than supernatural forces, as in obeah. When illness is interpreted within this belief system the treatment will be in the form of a "bush tea" made from local plants. Many people seek the advice of a bush medicine specialist. These individuals are known by no special cover term; they are simply recognized as being particularly knowledgeable in the domain of bush medicine. Again, this system has not remained static. Increasingly, the pharmacy and over-the-counter drugs have come to supplement bush medicine, as has been observed elsewhere (Logan, 1983).

The third ethnomedical belief system is, of course, Western medicine. I include this as an ethnomedical system because scientific knowledge about health and disease is invariably reinterpreted within the local cultural context. The most important aspects of the Western health care system are the health centers located throughout the island. The backbone of the health system is the registered nurse who staffs the center full-time. There is a district medical officer, usually an expatriate M.D., who covers a number of health centers in a district, treating patients on a weekly or bi-weekly basis. It is in this context that hypertensive patients receive their medication, where they are instructed in the importance of medication compliance and dietary behavior, and where they are exposed to scientific knowledge concerning hypertension and its treatment.

To determine how beliefs in each of these dimensions of ethnomedical beliefs influences compliance with the treatment for hypertension, a study of hypertensives under treatment at a single health center in St. Lucia was undertaken. Scales assessing each of the dimensions of ethnomedical beliefs were administered to the patients, as well as determining their level of compliance with the drug regimen. The study and measurement procedures are described in detail elsewhere (Dressler, 1980b; 1982). The rate of compliance with the regimen was found to be 48 percent in this group, or about equal to compliance rates found in the U.S. Rates of compliance in relationship to varieties of ethnomedical beliefs are shown in Figure 4. Higher levels of belief of all kinds are related to lower compliance rates, but this comparison achieves statistical significance only for beliefs in obeah.

These results indicate that ethnomedical beliefs are related to the success or failure of a treatment program for hypertension, although the specifics of this relationship are difficult to interpret. It is clearly not the case that "erroneous" beliefs in obeah inhibit following the treatment regimen since the "correct" (i.e., Western) beliefs about hypertension fail to conduce compliance. It probably has to do more with the psychocultural factors related to beliefs in obeah. As I have shown elsewhere, persons under high levels of the stress of culture change are more likely to believe in obeah (Dressler, 1983). These, of course, are also the persons who have higher blood pressure. Therefore, it is the person who is under greater stress who is at both the highest risk of hypertension

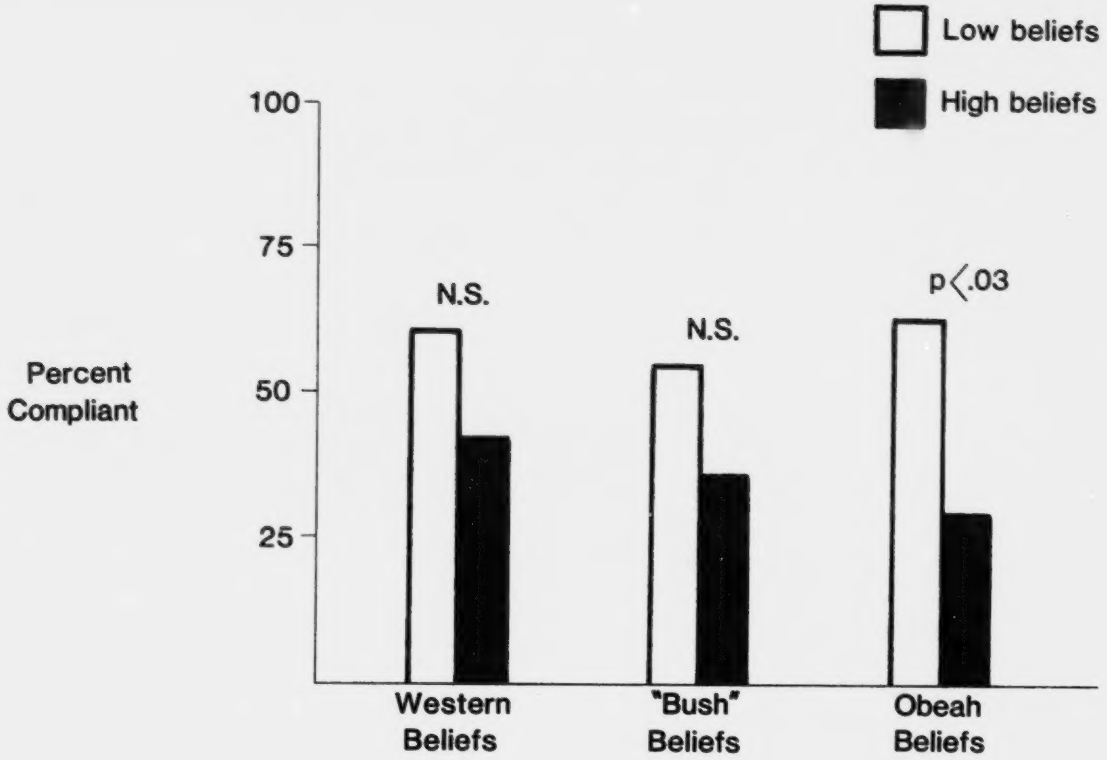


FIGURE 4

Individual Compliance with Hypertension Treatment in Relation to Ethnomedical Beliefs and noncompliance in treatment. Beliefs in obeah may represent a problematic coping style that both fails to protect an individual from stress and also fails to motivate them to cope with their disease. This is only an hypothesis for future research, but given that hypertension represents a significant public health hazard in St. Lucia, and given that we know so little about managing the disorder effectively, more research in hypertension control programs is clearly needed.

## Discussion

In this paper I have tried to place a single disease, essential hypertension or high blood pressure, in the cultural context of the Caribbean. The specific manifestations of hypertension cannot be understood apart from the specific trajectory of culture change in the region, nor apart from the specific historical processes operating within the region. The stresses of life in St. Lucia and the region as a whole, I would argue, stem directly from the nature of economic development over the past forty years. The kinds of social and psychological resources used by individuals to resist these stresses stem directly from traditional patterns of social life and value orientations that have been the subjects of Caribbean studies for many years. These same stresses and dimensions of traditional culture interact to influence the success of treatment programs for hypertension. In short, in the Caribbean hypertension is as much a sociocultural as a biomedical phenomenon.

This perspective has direct implications for programs aimed at the prevention and control of hypertension. Efforts to prevent a disease and conditions related to it are usually divided into primary, secondary, and tertiary prevention. Primary prevention refers to the identification of persons at risk of disease and the implementation of efforts to avoid disease onset within that group. Secondary prevention refers to the early identification and treatment of a disorder before it progresses. Tertiary prevention refers to rehabilitation with the aim of preventing the development of sequelae or attendant conditions. Most preventive work in hypertension has been in the area of secondary prevention, or large-scale screening to identify persons with mildly elevated blood pressures so that they can be treated before the disorder progresses to a more pathologic state.

A number of public health researchers, most notably Cassel (1976), have argued for the application of insights gained from sociocultural studies of disease to the design and implementation of primary prevention programs. Results of research on hypertension in the Caribbean suggest two forms such as intervention might take. The first form would be to alter the path of modernization and development in an attempt to eradicate the stressors associated with changing life styles. This would require one or both of two changes. One change would be a substantial alteration in the current distribution of wealth within Caribbean societies. A major source of stress for lower-class West Indians is their inability to achieve their life style aspirations. Presumably some form of economic redistribution of wealth could alter this. The other change would be a large-scale change in the values placed on attaining a North American middle-class style of life. If personal aspirations could be reoriented into an alternate, and perhaps more productive, style of living, this would remove some of the stress associated with culture change.

There is, however, one major logical flaw in a preventive intervention predicated on the eradication of stressors; that is, it is assumed that stress can be eradicated. This is probably a false assumption. In a specific sense it is evident from the research results from St. Lucia in that those persons who have been upwardly mobile and who have made it into a higher economic status still are under stress, but stress of an intrapsychic kind. In a general sense, from the sociocultural analysis of stress in St. Lucia, it is apparent the stress factors are built into human societies. Stress results from the dynamic interplay between individual values, aspirations, and behaviors, and the environmental constraints under which those individuals operate (Holroyd and Lazarus, 1982). To suppose that stress can be eradicated is to forget that stress and disease are a part of human adaptation (Dubos, 1965). This is not to say that the sociocultural changes noted above would not be useful or valuable in the long term; I only mean to emphasize that the eradication of stress is an impossible goal.

The second form a preventive intervention could take, and the one recommended by Cassel (1976), is to draw upon the traditional strengths of a culture that help people to withstand the effects of stress. It seems much more feasible to enhance a person's ability to cope with stress in a general way than to try to eradicate stress. This could be accomplished through interventions designed to teach people more effective coping skills and to increase levels of social participation and support. Prior to the implementation of such an intervention, however, there is an important research agenda to be addressed, and that is the effects of culture change on support systems and coping styles. As I demonstrated above, important social supports stem from the structure and organization of the extended family in West Indian society. There is ample research to show that it is the extended family system that very quickly begins to unravel under conditions of culture change (Graves and Graves, 1980). My own observations from St. Lucia suggest that upwardly mobile persons are less involved in the extended kin support system. Similar questions apply to involvement in voluntary associations.

If in fact the strengths of social supports in traditional forms are being diminished in the process of culture change, are there new forms of support systems emerging to replace them? What new forms of support systems could be developed to supplement these traditional forms? These are questions that both confront very directly a problem of applied concern in Caribbean society (i.e., hypertension), but also force us to employ all our theoretical acumen to understand fundamental societal processes.

Similar issues surround coping styles. "Direct-action coping" sounds very North American, but it carries a West Indian meaning that is not immediately apparent in its measurement. In the West Indian ethos there is a strong value placed on self-efficacy, control of one's own life and the exercise of free will. Aronoff (1967) predicated much of his analysis of West Indian personality on this ideal. It is important to determine how this significant orientation to the world has been influenced by the cultural change occurring in the Caribbean. It is conceivable that the combination of higher aspirations and lower economic resources for achieving those aspirations is teaching a generation of West Indian young people that their own efforts do not make a difference. If this is so, then new efforts to retain this value orientation in Caribbean culture must be mounted, as well as efforts to teach all persons this coping style.

Hypertension as a sociocultural phenomenon is also apparent from the analysis of responses to disease once it has been diagnosed and treatment begun. If the serious consequences of hypertension -- coronary heart disease and cerebrovascular disease -- are to be avoided, effective treatment must be maintained. This clearly requires behavioral change in the individual, but it is behavior that is embedded in a particular West Indian belief system. Furthermore, it is not a matter of simply correcting "erroneous" beliefs about hypertension. Rather, new approaches to patient education and treatment must be devised that incorporate the unique meaning of hypertension within Caribbean culture.

There are several concrete steps to be taken in the future to achieve the prevention and control of hypertension in the Caribbean. First, additional epidemiologic studies of hypertension are needed; these should evaluate the role of sociocultural factors in the etiology of hypertension in larger samples and in different communities, using additional controls for other dietary and physiologic risk factors. Second, research on preventive interventions, based on a biocultural model of hypertension, needs to be implemented. Third, experimental patient education and treatment programs that incorporate knowledge of ethnomedical belief systems need to be developed and carried out. With these research programs implemented in concert, the goal of minimizing the deleterious medical, economic, and cultural impact of hypertension in Caribbean society can be achieved.

## Notes

1. The following sources were used to derive these data for the respective societies: St. Kitts (Scheckloth, et al. 1962); Jamaica (Miall, et al. 1962), Bahamas (Johnson and Remington, 1961); St. Lucia (Dressler, 1982); and, for the U.S. data the 1972 HANES (Health and Nutrition Examination Survey) study was used. It should also be noted that the criteria for "hypertension" are not standardized across the studies. For St.Kitts, St. Lucia, and the U.S. the World Health Organization criterion of systolic of 160 and/or diastolic of 95 (or higher) is used. For Jamaica, diastolic blood pressure in excess of 100 mm Hg is used.

2. Research in St. Lucia was supported by a research grant from the Connecticut Research Foundation and a fellowship from the University of Connecticut Health Center. This paper was invited for presentaiton at the conference "New Perspectives on Caribbean Studies: Towards the

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# THE CRISIS OF THE DOMINICAN REPUBLIC MEDICAL MODEL: Alternatives for the Year 2000

GUAROCUYA BATISTA V.

Department of Post-Graduate Education
Universiaded Autonoma de
Santo Domingo

## I. Four Basic Concepts

It is helpful to begin by clarifying the meaning of four basic concepts as they will be used in this paper.

### 1. Health

Besides the classic definition of the World Health Organization, which considers health not only as the absence of disease but also as a state of biological, psychological and social well-being, we shall refer to a definition used currently in Nicaragua: Health is a state of personal, familial and social well-being. The two definitions are correlative. Both include the biological and the social determinants of the health/disease process. From the social and the political points of view, both imply a strategy of true development and real democracy.

## 2. Primary Care

This term includes health primary care, but goes beyond this to "the entire variety of practices of the State and the Organized People that guarantee the right to work, to basic nutrition, to education, to social security, to health services and to an environment adequate for the reproduction of the existence of the people." As far as health is concerned, we believe it preferable to talk about basic services instead "primary care", including in the first concept priority of care for the mother and child and the workers, with preventive case actions and planned secondary care involving practices directed to the permanent education of the people.

## 3. Medical Model

This is the summation of answers produced by a society for the problems related to the health/disease process. In this "social construction", not only health professionals (physicians, nurses, nutritionists) participate, but also the hegemonic society, as well as the different sectors that integrate a social formation. Since all the groups or classes of a given society do not have the same perspective on the health/disease problems because they do not have the same material and spiritual interests, the dominant ruling sectors may impose their practices and policies, although not without social or political struggle, using the power of the State if it is needed.

## 4. Hegemony

With this concept, taken from the writings of the Italian, Antonio Gramsci, we will refer to the capacity of a social group or class to present their interests as if they were the common and natural interests of the global society. Furthermore, hegemony means the ability of those social sectors to obtain the acceptance of its interests by the majority of the persons, not by the use of coercion but by consensus. It is a form of synthesis of domination, but on the ideological ground. Very relevant for hegemony is the functioning of the so-called "ideological apparatus": schools, churches, health structures, political parties and so forth, all belonging to the "civil society".

We believe with Sergio Arouca and others that, in a broad sense, "health constitutes a space for the hegemony of social classes through social policies related to social reproduction."

## II. Three Theses about the Hegemonic Medical Model

Thesis 1: The medical model of the Dominican Republic is in a deep crisis.

There are currently no reliable statistical data on morbidity or mortality in the Dominican Republic, a fact recently recognized by Health Ministry officers. The "approximate figures" would demonstrate that our health situation has improved very little in the past twenty years. Furthermore, several indicators reveal at least some degree of deterioration.

The Dominican Republic has a population of 5,620,000 (1981). The health situation is shown by the following figures:

- 20 to 40 percent of the total population is without health care (by organized structures)
- the National Health System is nonorganized
- 65 percent of children under 5 are undernourished (in protein or calories)
- infant mortality rate is 130.5 per 1,000 live births
- leading cause of death is gastrointestinal disorders among infants
- only 12.7 percent of the economically active population are protected by the Social Security Institute (2,600,000 people are unprotected)
- physician/population ratio is 1 per 23,000

When it comes to the quantification of the level of well-being (and hence the magnitude of poverty) of a population, the Dominican Republic, like many other countries in Latin American and the Caribbean, shows what Sanfuentes and Lavados have called heterogeneity of poverty. This means that "there is no systematic relationship between the different basic needs, whatever may be the standard defined". Because of this situation, the indicators that have been discussed would show some of the dimensions of poverty. But there are some synthetic indicators useful for an approximate measure of poverty and well-being.

The first one, the Physical Quality of Life Index (PQLI), developed by Morris D. Morris, measures the level of physical well-being. It is calculated from data for infant mortality, life expectancy at age one, and literacy, and is given on a 0 to 100 scale.

Table 1 shows the PQLI of different countries in Latin America and the Caribbean for the years 1970 and 1978. For 1978 Cuba has the highest index, 93, followed by Barbados, with 91, and Trinidad and Tobago, 90; Costa Rica, Uruguay, Argentina and Jamaica have the same index: 88. The Dominican Republic has a low index, 63; the lowest indices are those of Bolivia, 51, and Haiti, 35.

A second synthetic indicator is the Disparity Reduction Rate (DRR), developed in 1978 by James Grant of the Overseas Development Council. It measures the rate of progress in achieving physical well-being: that is, "the rate at which a country is closing the disparity (or gap) between its level of performance in any social indicator and the best performance expected anywhere in the year 2000."

TABLE 1

Physical Quality of Life Index (PQLI)

| COUNTRY | 1970 | 1978 |
|---|---|---|
| Cuba | 83 | 93 |
| Barbados | 87 | 91 |
| Trinidad-Tobago | 86 | 90 |
| Jamaica | 84 | 88 |
| Venezuela | 77 | 81 |
| Dominican Republic | 58 | 63 |
| Haiti | 35 | 35 |

Source: Dimensions of Poverty in Latin America and the Caribbean, UNICEF, 1982.

Table 2 shows the DRR of four social indicators, including the PQLI, from 1970 to 1978. Again, Cuba showed the best performance, in this case in the rate of progress in life expectancy, literacy and physical quality of life. Jamaica displayed greater progress in lowering the rate of infant mortality. The Dominican Republic had a very poor performance in the PQLI and literacy.

TABLE 2

Disparity Reduction Rate (DRR), 1970-1978

Social Indicators (%)

| Country | Infant Mortality | Life Expectancy | Literacy | PQLI |
|---|---|---|---|---|
| Cuba | 5.8 | 5.4 | 32.0 | 10.5 |
| Barbados | 2.8 | --- | 4.9 | 4.5 |
| Trinidad-Tobago | 2.5 | 5.4 | ---- | 4.1 |
| Jamaica | 7.8 | 3.4 | 3.0 | 3.5 |
| Venezuela | 2.7 | 2.3 | 3.0 | 2.4 |
| Dominican Republic | --- | 4.6 | 0.6 | 4.5 |
| Haiti | --- | 1.5 | -1.5 | ---- |

Source: Dimensions of Poverty in Latin America and the Caribbean, UNICEF, 1982.

Thesis 2: The crisis of the medical model is a component of the crisis of the hegemonic society.

There has been a significant growth of poverty in the Dominican Republic. Utilizing the methodology and indicators used by the Salvadorean economist Roman Mallorga to present the evolution of poverty in Central America, we found that in our country absolute and relative poverty increased during the period 1970-1980 (Table 3).

## TABLE 3

### Absolute and Relative Growth of Poverty in the Dominican Republic, 1970-1980

| | 1970 | | 1980 | |
|---|---|---|---|---|
| | Pop. Affected | % Total Pop. | Pop. Affected | % Total Pop. |
| Overt Unemployment | 428,228 | 20.0 | 710,000 | 25.5 |
| Education<br>Number of illiterates 15-64 years | 721,564 | 30.0 | 800,000 | 36.0 |
| Housing<br>Number of persons with piped water supply | --- | ---- | 2,662,460 | 62.0 |
| Health<br>Number of persons with adequate medical-hospital services | 2,688,000 | 64.0 | 3,560,000 | 71.0 |

Overt unemployment jumped from 20 percent to 25.5 percent of the total economically active population; the number of illiterates also increased, as well as the percentage of them in the population aged 15 to 64 years. In 1978, 62 percent of the total population was without a piped water supply; this amounted to more than two and a half million persons. When we look at the state of the health services, the percentage of the population without adequate medical and/or hospital services increased from 64 percent to 71 percent. From 1964 to 1968 an important reduction in the daily consumption of protein, potatoes and cereal also occurred.

More recent data, although incomplete, strongly suggest that there were not positive changes in the social indicators from 1980 to 1983. Karen Lashman and John Daily have written that "the economic growth of the Dominican Republic does not seem to influence the revenues of the poor as significantly as those of the rich... For this reason one could not expect that a greater improvement of the typical Dominican family that allow it to have access to health services was going to come forth automatically from the socioeconomic development of the country."

A question arises: If from 1966 to the late 1970s the gross domestic product, and hence the per capita income or product as classically calculated, grew significantly in the Dominican Republic, why is there a concomitant growth of absolute and relative poverty? The answer could be due to what Mallorga has called "excluding and concentrating economic growth": excluding because the majority of the population remained out of the distribution of wealth; concentrating because the wealth produced socially, and by many hands, is held by a few. The whole society functions as a machine that produces poverty. We want to emphasize that this is the outstanding contradiction of all capitalist societies.

At present, with the impositions of the International Monetary Fund, poverty has increased. An estimated one and a half million survive with monthly revenues below the line of absolute and critical poverty.

We do not agree, however, that the group of measures adopted by the Dominican government, at the initiative of the IMF, explains the deep economic and social crisis as well as the incipient political crisis. The Fund was a recourse of the ruling sectors, but the real cause of poverty lies in the organization of our society, and in particular of our economic structure. Thus, the crisis of our medical model is but a component of the crisis of the economic model of growth.

Thesis 3: The crisis of Dominican society is the consequence of the 1965 U.S. military intervention.

The Dominican Republic has suffered two major military occupations. The last one, initiated on April 28, 1965, crushed a political popular revolution with bourgeois democratic objectives and ended with the installation of Dr. Balaguer's despotic regime in 1966. Balaguer implanted an economic model of capitalist "development" built on imports and foreign (U.S.) investments. Capitalist accumulation was guaranteed by means of political and economic coercion (freezing of wages).

To understand the progressive deterioration shown by health indicators, it is useful to look at three socioeconomic indicators: the cost of living, the level of wages and the mean gross profit of capitalists (Table 4).

By 1974 the cost of living had already increased with an index of 148 percent. Nominal wages diminished significantly in 1970, and since then have continued to decrease, which amounts to a severe reduction in real wages. We must remember that in capitalist countries such as the Dominican Republic, health services are acquired with money; for the vast majority of the economically active population, money means wages. In contrast to the decline of wages, since 1968 the mean gross profits of capitalists have increased, reaching in 1971 an index of 197 percent as compared with the reference year of 1964.

What Table 4 shows is economic growth but without "development of the underdeveloped." This is due to the deepening of our dependence upon the U.S. From 1962 to 1972, the direct foreign investment index grew each year, from 72 to 261. These direct investments went to agriculture, mines and the manufacturing sectors. On the other hand, the foreign debt increased 143 percent from 1966 to 1971. At the present time, more than 40 percent of our gross national product is used to pay the debt services.

The post-military (or better, the post-U.S. intervention) social and economic reorganization started in 1966. It implied a new look at the health problems and finances. Two new health policies will be discussed briefly.

a) Birth Control: In The Quality of Life in the Americas Rockefeller has written: ..."of all great concerns of the other nations of the hemisphere none is more urgently related to public health, economic growth and social progress than the growth of the population." Months later a U.S. - designed policy of birth control was applied in the Dominican Republic after the Agreement 517-L-021 was signed. The U.S. Agency for International Develop-

TABLE 4

Cost of Living, Wages and Mean Gross Profit of Capitalists, 1964-1974*

| Date | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cost of Living | 106 | 100 | 98 | 100 | 102 | 100 | 104 | 108 | 117 | 134 | 148 |
| Wages | 106 | 101 | 95 | 77 | 103 | 100 | 96 | 97 | --- | --- | --- |
| Mean Gross Profits of Capitalists | 57 | 49 | 80 | 91 | 100 | 132 | 164 | 197 | --- | --- | --- |

*1960 = 100

ment promised to pay 7.1 million (U.S. dollars) for a "Mother-Child Program" on condition of "evidence that the recipient has created a National Council of Population and Family to supervise within the hospitals all the matters related to population." Also, it required that the Dominican government must "coordinate all the programs of birth control." In this context the rural clinic appeared, one of the basic supports of today's primary and secondary health care. In 1969 there were only 15 of them; in 1972, 57 were functioning, with a total of 100,000 women who accepted birth control. In 1982, of 465 health establishments under the administration of the Health Ministry, 337 were rural clinics.

b) Priority to private medicine under the auspices of international financial bodies: According to the Dominican government, in 1970 it presented a National Program of Control of Preventable Diseases to the Special Fund of the United Nations Development Program. The principal aim was to vaccinate 60 percent of the children under six years of age against diphtheria, tetanus and whooping cough; to vaccinate women from 15 to 44 years against tetanus; and to inoculate 80 percent of the population under 15 years of age against poliomyelitis, smallpox and tuberculosis. The cost of the program was (U.S.) $1,563,894; the advisory agency was the World Health Organization. The program was not carried out.

An interesting development occurred, however, in private health care. A significant share of the resources of FIDE, the Investment Fund for Economic Development (obtained from contributions of the U.S. Agency for International Development, the Interamerican. Development Bank, the World Bank, and the Central Bank of the Dominican Republic) was directed to private medicine. Of a total 713 loans offered to all economic sectors, 172 went to private medicine, amounting to 10.8 million pesos and mobilizing RD$ 411,000 in internal popular savings. For the same period the agrarian sector received loans for only 8.7 million pesos.

What were the aims of this policy?

1. To create a physical network that would function as a health industry

2. To enlarge the health sector as a space of production and marketing

3. To ensure a good mean profit to the capitalists

4. To help dynamite the economic model of growth

5. To enrich the U.S. and promote capitalism

During the 1965 popular insurrection, the middle class played a protagonistic role. The priority given to private medicine, together with some other measures including birth control, were essentially policies of anti-insurgency.

Of course, one of the rejected ways of real economic development and real popular consent was land reform. The reason? Landowners were part of the ruling group. According to the 1981 census, of a total of 385,000 holdings of cultivated land, 82 percent have less than 80 tareas (that is, under the limit for self-sufficiency). On the other hand, 47 percent of the landholdings with more than 1,000 tareas are concentrated in a few hands. More than 2 million rural people have no land or a very small holding, not enough to guarantee family survival.

## III. Alternatives for the Year 2,000

The Dominican government has signed the Alma-Ata Declaration of the World Health Organization. That means that it has promised to work toward the goal of Health for All in the Year 2000. Of course, the next governments will have to improve the present health policies. A very good campaign to eradicate poliomyelitis has been carried out in the Dominican Republic under the supervision of Dr. Albert Sabin. We hope that every year this campaign, as well as others, will be repeated in order to eradicate or at least to control the majority of transmissible diseases. At the present time, massive vaccination in the Dominican Republic also has a hegemonic attitude, seeking political consensus in the midst of a calamitous economic and social situation.

In order to get a progressive improvement of our health practices, we need: 1) health policies of broad scope aiming at the real well-being of the population; 2) financing with either outside or internal resources; 3) health and allied personnel; and 4) organization and mobilization of the people.

The financing of the health programs is very difficult to obtain. Foreign aid, in the vast majority of instances, has been insignificant. Looking at our usual privileged helper, the U.S., we should ask ourselves if, from the political and the strategic points of view (considering the foreign policy of the current U.S. administration), there is any sound reason to channel toward the Dominican Republic the massive aid that is needed. If our country borrows money, with the variable rates of interest of the U.S. banking system, every few months we must work harder to pay our debt. This amounts to a periodic and automatic worsening of our economic bleeding.

It seems that the Dominican Republic cannot improve the quality of life without a reorganization of its economic structure. We are tempted to say that we need to dismantle an economic machine that produces richness for the few and critical poverty for most citizens. That would mean a return to a national project that has been interrupted many times by foreign intervention, political, military or both.

All data strongly suggest that without a radical transformation of the economic, social and political structures of underdeveloped societies, the crisis of their hegemonic medical models will not be solved. If social transformation occurs then, but not before, the people will organize and mobilize themselves to improve their health system. We have some recent examples in Latin American and the Caribbean.

The right of people to good health means the permanent sovereignty of the people.

# HEALTH AND DEVELOPMENT IN CENTRAL AMERICA*

RICHARD GARFIELD

## Introduction

Concern for Central America is greater now in the U.S. than at any time since the 1959 Cuban revolution brought a sudden awareness of the need for change. This article examines possible responses by reviewing data on health conditions and discusses health models and policy alternatives for the region.

The Central American region has experienced some of the most rapid economic growth ever witnessed in the Third World.[1] It experienced a 6 percent average annual growth rate during the 1960s and a 4 percent rate during the 1970s. Almost all of this growth was in the export-oriented agriculture or import-substitution finishing industries. Central America's proximity and economic dependence on the U.S. has limited diversification and industrialization, leaving land and wealth heavily concentrated in the hands of traditional elites. Every country in the region still earns more than half of its foreign exchange from the sale of primary products which include cotton, coffee, sugar, or bananas.[2] Seventy-three percent of the region's land is owned by four percent of the population, while the poorest 77 percent have only 7 percent of the land.[3] This economic form structure means that economic growth directly benefits only a small part of the population, while the majority continue to suffer under primitive living conditions. It is estimated that more than two-thirds of the people of Central America live in poverty.[4]

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Falling prices for traditional exports, rising interest rates, falling foreign investment, and rising costs for imported oil and debt servicing have seriously affected the Central American economies. From 1980 to 1983, per capita Gross National Product in these countries on average 6 percent annually. Combined with social strife, militarization, and large refugee populations, the already precarious living status of the majority has worsened. One result of this crisis is a growing influx of refugees to the U.S. As many as 100,000 undocumented Central Americans enter the U.S. each year. This movement brings with it a predictable burden of disease, including the possibility of establishing foci of dengue hemmoraic fever in the U.S.[5]

The severe economic and social crisis affecting the region has prompted a major international response. Bilateral and multilateral assistance, especially from the United States and from organizations of the United Nations, may lessen the effects of the crisis. Beyond helping individuals to survive during this period, health assistance can promote understanding and cooperation among the countries of Central America. Such a dialogue will be necessary for the region to develop a consensus on its path out of the present crisis and toward development.

## Health Conditions

Little accurate social data exists for the Central America countries. Methods used in developed countries, such as death certificates, have little meaning where as many as 70 percent of infant deaths go unreported.[6] Global data for the main health-related indicators nevertheless show the poor conditions under which most of the people live. Only in Costa Rica (since World War II) and Nicaragua (since a post-revolutionary literacy campaign in 1980) are most adults literate. From 20 to 50 percent of the people lacked access to potable water in

1979.7 Far fewer have any form of sanitary waste disposal system, and almost all of these were in urban areas. Nutritional surveys carried out in the late 1970s showed that proportions varying from 43 to 73 percent of children under five years old suffered some degree of nutritional deficiency. Between 9 and 30 percent of children under five suffered from second- or third-degree malnutrition (Figure 1). The rate of malnourished under-five-year-olds fell to 39 percent in Costa Rica but rose to 80 percent in Honduras by 1982. It is believed that falling food production and rising consumer prices during the region's present economic crisis are responsible for rising levels of malnutrition.

## Population Growth

The dominance of export agriculture led increasingly after World War II to the isolation of the rural population. Growth in plantation agriculture forced subsistence farmers into remote regions or into unproductive activities in urban shanty towns. In both cases, traditional demographic trends continued in spite of economic growth. Central America has the highest birth and death rates in Latin America. Women continue to have an average of 6 or more children, yielding the highest annual population growth rates (2.4 to 3.9) in Latin America. Total population for the five Central American countries in 1983 was estimated at 22.3 million (Figure 2). About half of the people lived in communities of less than 2,000 people. In all the countries, export agriculture, because it mainly requires migrant harvesters' for several months of the year, was unable to absorb a rapidly growing population into the permanent work force.8 This process was most severe in Nicaragua, where the entire work force grew only 6 percent from 1963 to 1971 while the general population aged 15-64 grew by 40 percent.9 Only in Nicaragua does the majority of the population live in urban areas.

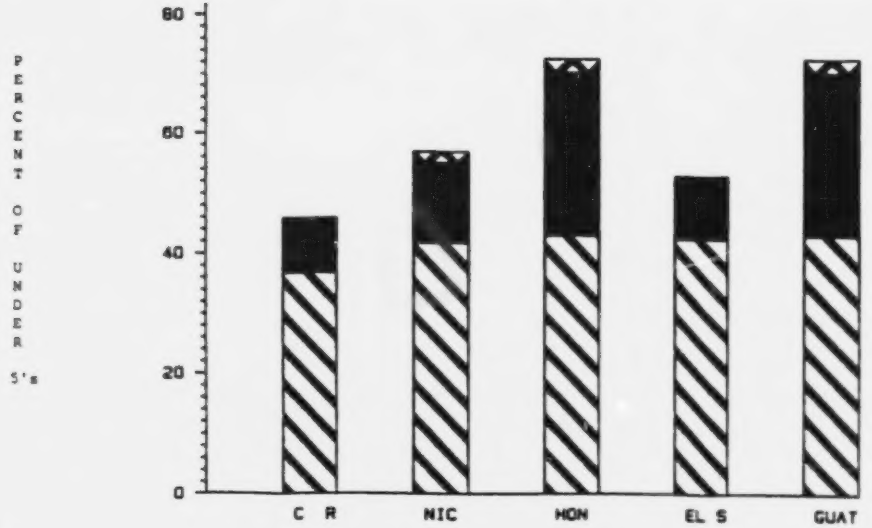
## Needs and Responses

Some assume that these conditions were, until recently, passively tolerated. Yet opposition to dictators, foreign intervention, and deteriorating standards of living led to guerrilla wars in Nicaragua and El Salvador in the 1930s, mass strikes in Honduras in the 1940s, and the election of social democratic governments in Guatemala and Costa Rica in the 1950s. Only the Costa Rican government was able to survive

FIGURE 1

# PERCENT OF UNDER FIVES WITH NUTRITIONAL DEFICIENCY

## BY DEGREE OF DEFICIENCY



Lined bar represents first degree malnutrition.
Solid bar represents second degree malnutrition.
Crossed bar represents third degree malnutrition.

Source: Pan American Health Organization 1982.

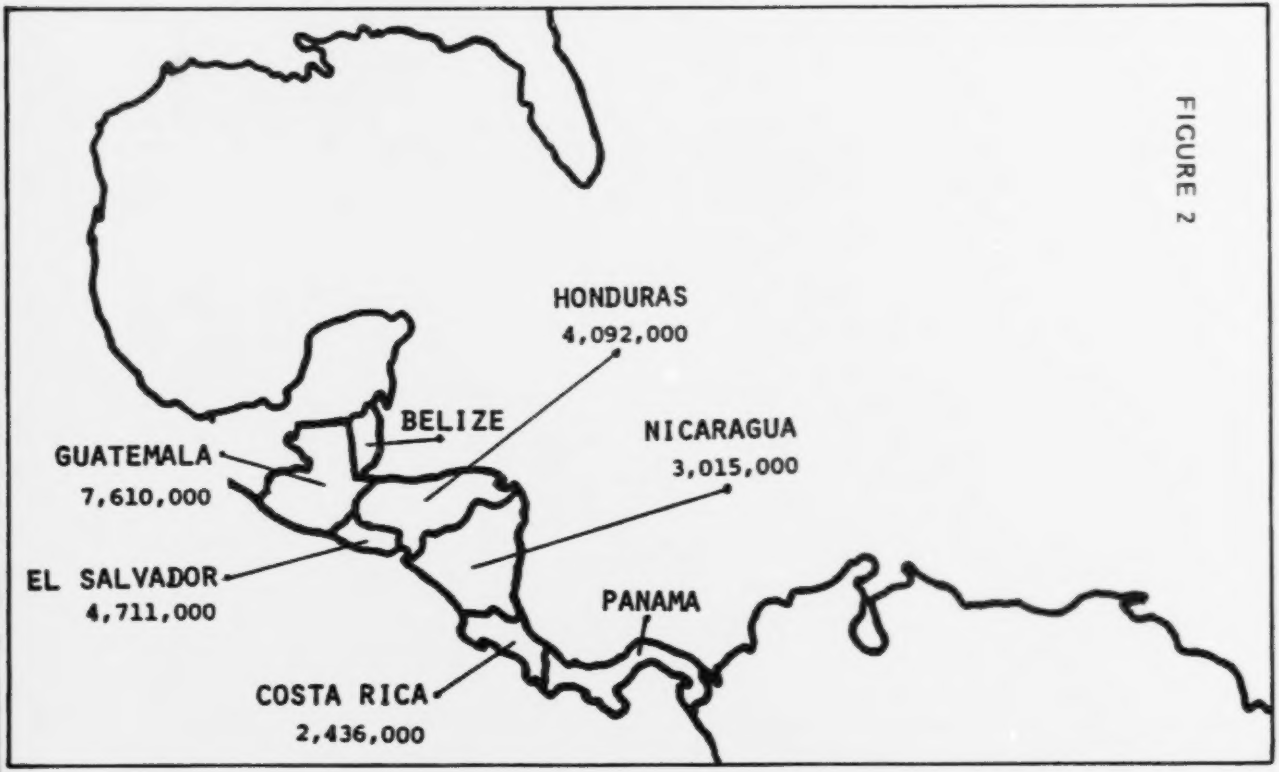

HONDURAS
4,092,000
BELIZE
NICARAGUA
3,015,000
GUATEMALA
7,610,000
EL SALVADOR
4,711,000
PANAMA
COSTA RICA
2,436,000

FIGURE 2

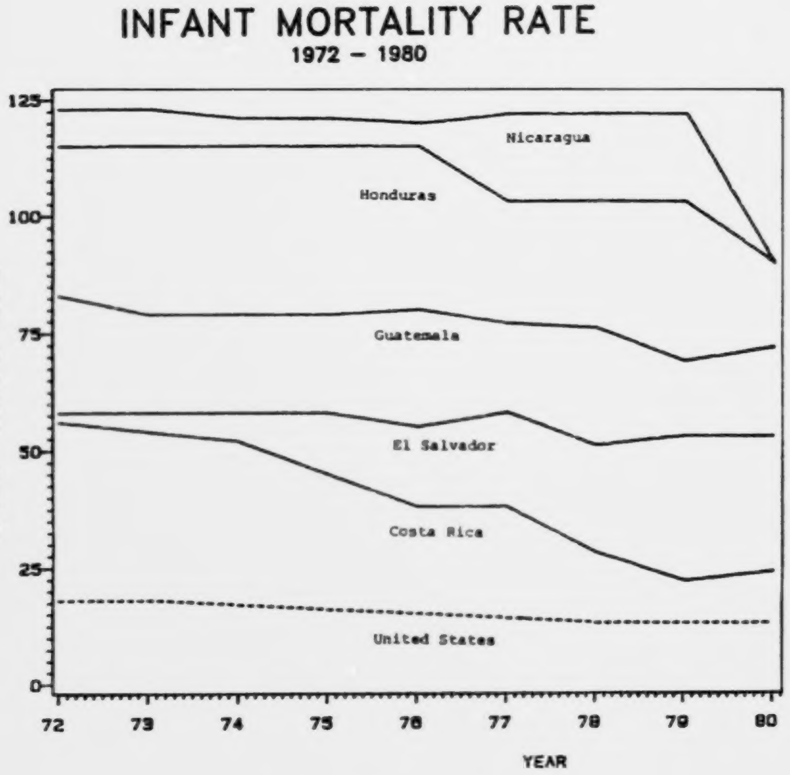
attacks by conservative elites and foreign financiers. Costa Rica went on to disband its army, promote social welfare through investments in health and education, and begin industrialization.10 More recently, guerrilla struggles reappeared throughout Central America. The most successful of these was the Sandinista movement in Nicaragua which fought for 18 years before coming to power in 1979 with promises to radically improve living conditions despite the country's poverty.11 The Sandinista revolution was seen as an encouragement to other opposition movements in the region and a threat to the rich elites and some of their foreign allies. Indeed, our current awareness of Central America might never have occurred had not the Sandinista revolution caused concern in the 1980s, as the Cuban revolution did in the 1960s.

## Death Rates

Predictably, the mortality profile in Central America is dominated by diseases which can be prevented through immunization, health education, and sanitary engineering. In the period 1975-1980, two-thirds of the deaths in Central American were in excess of the number which would have occurred at the death rates to be found in the United States. These potentially preventable deaths, 161,000 of a total of 240,000, came predominantly from among young children.12 About 90 percent of all child deaths were in excess of those expected at U.S. age-specific mortality rates. Costa Rican mortality patterns have improved rapidly during the last two decades and now are similar to those of the developed countries in urban areas (see Figure 3). Rural areas still have infant death rates 50 percent greater than in the cities, producing a pattern more similar to the rest of Central America. Elevated mortality within each of these countries has been shown to be associated with rural residence, low income, low educational levels of the mother, indigenous race, and low social class.

Despite the limited registration of deaths, the differing mortality profiles in the U.S. and Central America are made apparent by official figures. The reported death rate per 100,000 population in Central America in 1975 was fifty times higher for infectious and parasitic diseases, diarrheal diseases,and nutritional deficiencies. It was nine times higher for pneumonia and influenza and double for violent deaths (see Table 1). In 1970, dehydration secondary to diarrheal infections was the prime killer of infants in each country.

FIGURE 3



Source: Ruth Sivard 1983.

TABLE 1

DEATH RATE PER 100,000 POPULATION*

| | Costa Rica 1975 | Nicaragua 1973 | Honduras 1975 | El Salvador 1973 | Guatemala 1975 | U.S. 1975 |
|---|---|---|---|---|---|---|
| Infectious and Parasitic Diseases (000-136) | 55.5 | 141.8 | 138.3 | 168.9 | 414.4 | 5.6 |
| Diarrheal Diseases (004-009) | 27.1 | 97.0 | 96.4 | 118.6 | 222.5 | 1.1 |
| Pneumonia and Influenza (470-474, 480-486) | 31.1 | 190.5 | 26.8 | 33.7 | 190.5 | 12.3 |
| Avitaminosis and Other Nutritional Diseases (260-269) | 9.1 | 2.1 | 9.3 | 15.0 | 48.4 | .5 |
| Homicide and War (E960-978, (990-999) | 5.1 | 24.0 | - | 29.9 | 20.5 | 2.8** |
| Poorly Defined Causes (780-796) | 38.7 | 151.8 | 208.3 | 258.9 | 208.0 | 11.8 |

* Causes as defined by the eighth revision of internaitonal disease classification
** 1971

Source: Pan American Health Organization, 1978, 1982.

Gradual improvements during the 1970s in Costa Rica and an oral rehydration campaign in Nicaragua begun in 1980 as a follow-up to their literacy campaign reduced diarrhea and its sequella to the fourth leading cause of death in those two countries.

Of 850,000 children born each year in Central America, 100,000 suffer from low birth weight. About 100,000 of those who are born each year will die before reaching their fifth birthday. Of those who survive, two-thirds will be malnourished and about 10 percent will have physical or mental limitations because of malnutrition.13

Figures relating to violent death suffer the greatest underreporting of any category. Even official registries in El Salvador put violent death as the first or second most common cause of death since 1980. At least 40,000 people have been killed by death squads in that country and innumerable more have been killed in government attacks on rebel-held territory.14 It is estimated that 20,000 Guatemalans, most of them indigenous, have been killed by the army of that country. Fifty thousand people died during the Nicaraguan revolution, 10,000 "contras" have been killed by Sandinista troops, and close to 2,000 Nicaraguan citizens have been killed in the last two years of CIA-funded "contra" attacks on that country. In total, more than 120,000 Central Americans have died from war-related causes since 1978. This amounts to about 10 percent more deaths than occurred from routine causes during this period.

It is estimated that approximately half a million Central Americans now live as refugees within the region. One hundred thousand Nicaraguans have left their homes for areas better protected from "contra" troop attacks. About 100,000 Guatemalans in Mexico and 300,000 Salvadorans in Honduras and El Salvador live under precarious conditions in camps with irregular food supplies, random attacks from hostile troops, and poor sanitation. Almost all of those in refugee camps are women and children who fled air bombings or armed attacks on their villages. These refugees form a population at extremely high risk for all types of morbidity and mortality. They may account for 5 to 2 percent of additional deaths above the normal high levels.

## Mortality and Life Expectancy

Although mortality levels have fallen relatively rapidly in Central America since World War II, they remain high. While life expectancy at birth in Costa Rica is only four years less than in the U.S., the other countries average 13 years less. This is the level reached in the U.S. more than 50 years ago. Technological advances and the beginning of economic development permitted Central America to improve life expectancy in the last 30 years by as much as occurred during a 60-year period in the U.S., from 1890 to 1950.15 Political and social strife in Central America is, however, slowing or reversing some of this advance. Some countries in the region may even be experiencing a fall in life expectancy rates at present. Many population sectors benefited only marginally from changes in their countries when the economy was booming and conditions were more stable; at present these groups bear the brunt of the war, malnutrition, economic problems and lack of health services. Partial exceptions to the slowing or reversal of decline in infant mortality are Costa Rica, which has maintained much of its political stability and economic prosperity, and Nicaragua, which has radically expanded social benefits during the last five years among those who most need them. An effect of this social change has been a very rapiddecline in infant mortality in Nicaragua, from 122 per 1,000 live births in 1978 to 80.2 per 1,000 in 1983.16

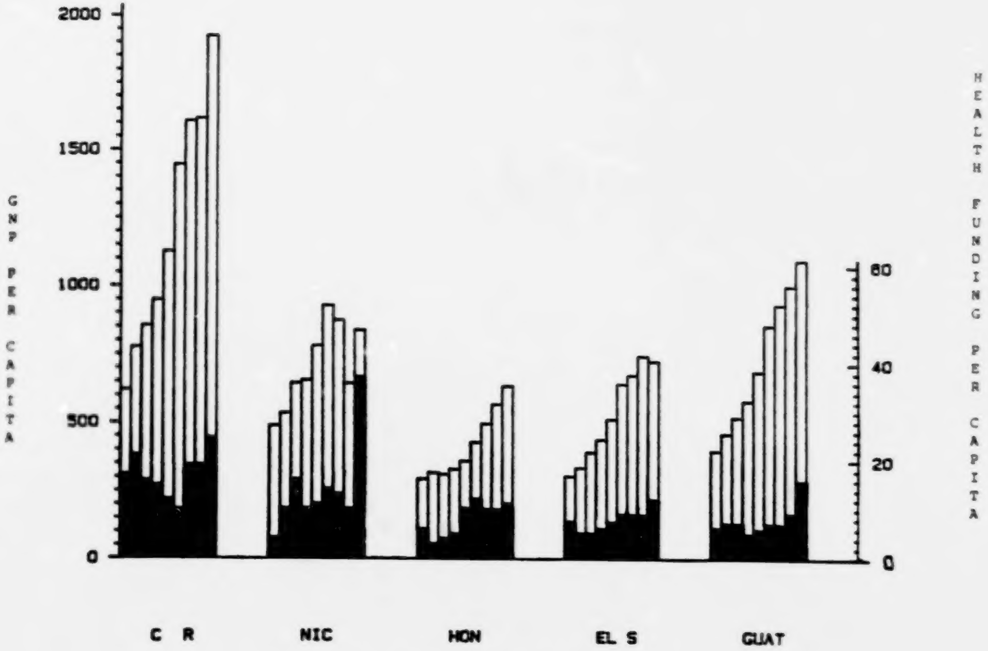
## Health Facilities and Personnel

Despite rising incomes, the level of government funding for health services rose only slowly in most of Central America during the 1970s (Figure 4). More importantly, many health investments were poorly utilized.17

In the countries with the poorest coverage, private hospitals serve the affluent (Figure 5). Social security systems provide far superior health benefits to insured workers than are available to the rest of the population. Only in Costa Rica and, since the revolution, in Nicaragua, are social security funds used for the benefit of the general population. Few beds are available to people in rural areas. Forty percent of the region's population, a total of 10 million people who live mostly in Guatemala, Honduras, and El Salvador, lack access to health care services. Yet enough facilities exist to meet most of the populations' needs (Figure 6). It is estimated that a 10 percent

# GNP AND HEALTH FUNDING PER CAPITA

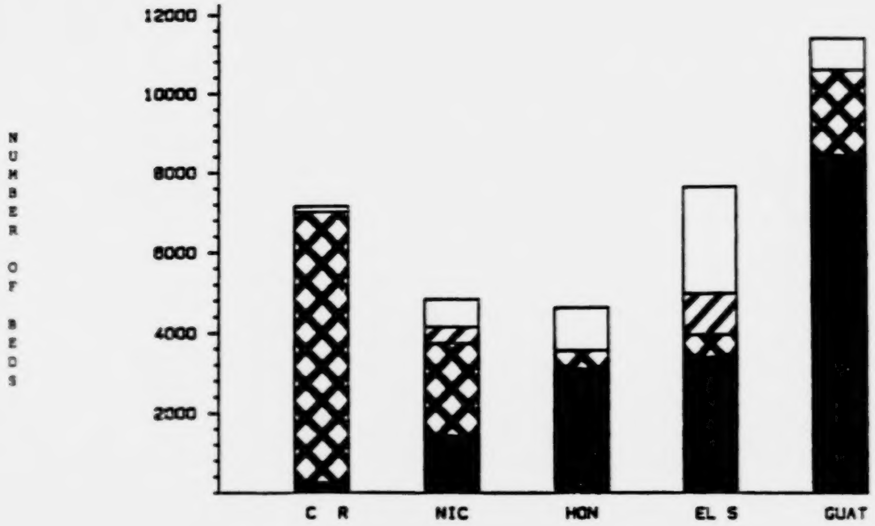
1972 – 1980



Source: Pan American Health Organization 1982.

FIGURE 5

# HOSPITAL BEDS BY OWNERSHIP, 1978

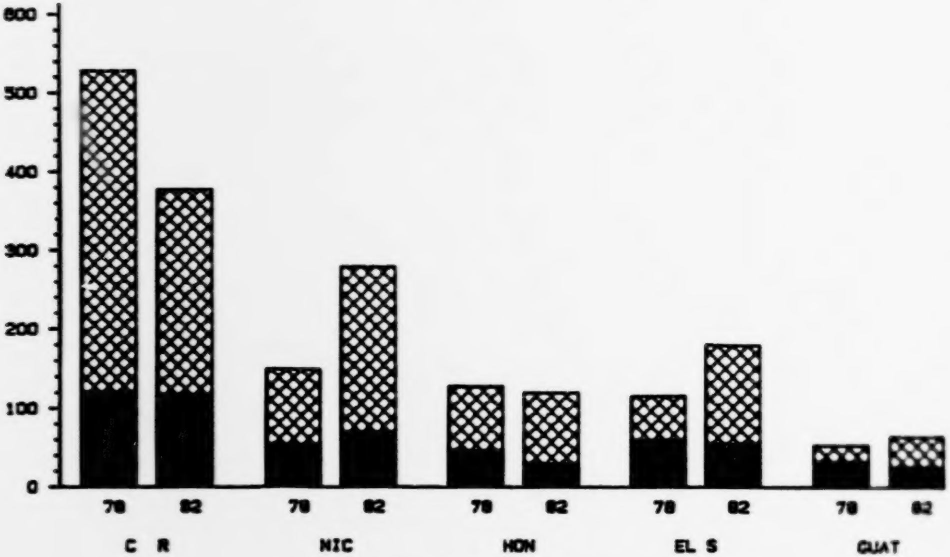


Solid bar represents publicly owned beds.
Crossed bar represents social security system beds.
Lined bar represents other non-private beds.
Unlined bar represents private beds.

Source: Pan American Health organization 1982.

# HOSPITALIZATIONS AND MEDICAL VISITS

1978 AND 1982



Solid bar represents number of hospitalizations per 1000 population.
Crossed bar represents number of outpatient visits per 100 population.

Source: Pan American Health Organization 1982, 1984.

increase in funds could equip and extend the existing facilities to provide basic care for the whole population.18

The incidence of malaria rose rapidly in the late 1970s, with a tripling of cases detected from 1975 to 1980. While Central America contains 3.5 percent of the population of Latin America, it recorded in 1982 a third of all malaria cases detected in the hemisphere.19 Since it is assumed that only about a quarter of all cases are diagnosed, the size of the population sample for malaria is an important indicator of the disease burden as well as malaria control efforts. Only in Nicaragua have mass health education and control campaigns been able to reduce the disease significantly since 1981.20 These efforts, based on a stepped-up search for cases by volunteers in each community, departs from the traditional model of malaria control which focuses predominantly on routine pesticide sprayings by technicians.

The number of physicians per 10,000 population in Central America rose from 5.0 in 1964 to 7.3 in 1979, but is still the lowest in Latin America and half that of the U.S. (Figure 7). Urban-rural maldistribution and the overwhelmingly private character of medicine means that most of the population will never see a doctor. Compounding the shortage of physicians is the lack of support staff. Although the number of nurses per 10,000 population rose from 3.7 in 1964 to 6.4 in 1979, there is still less than one nurse per physician. Central America has a nurse/population ratio that is about one-tenth that of the U.S.The imbalance in the nurse to doctor ratio helps to explain why even simple technologies like oral trivalent polio vaccination have not been used sufficiently to reach effective immunization levels. A polio epidemic in Honduras in 1984, like a typhoid epidemic in El Salvador during 1983 and 1984 and a post-war measles epidemic in Nicaragua in 1979, shows the imbalance in a system which has focused on training doctors while neglecting basic sanitary measures.

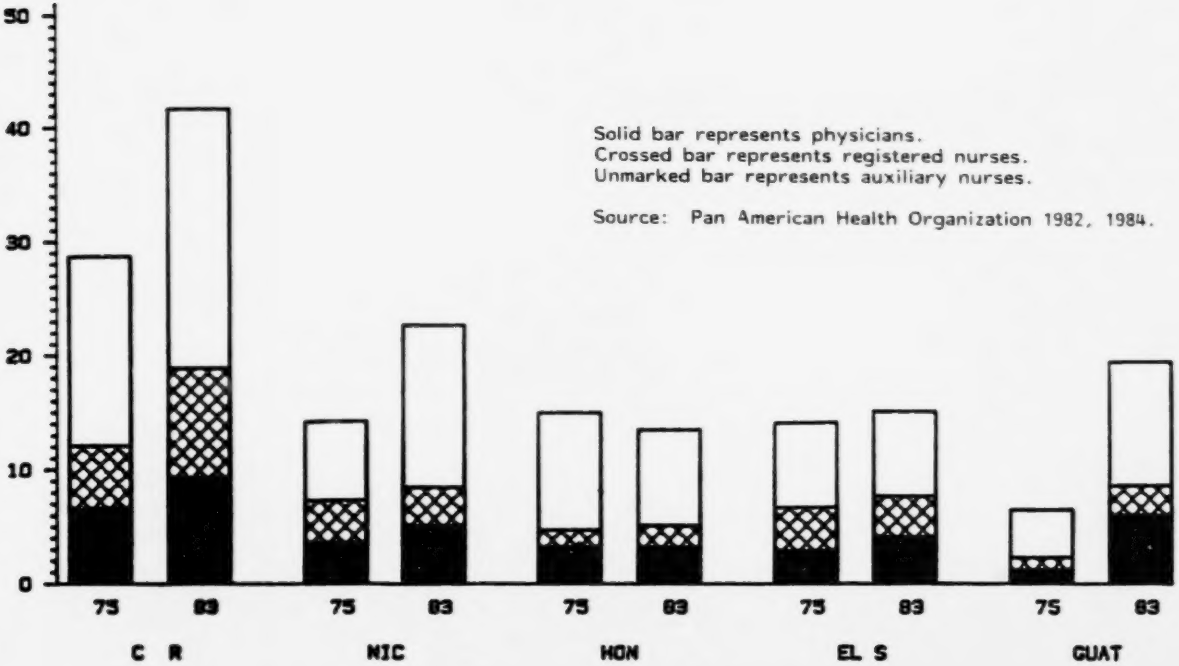
## Health Models

Three general models for the provision of health services can be identified in Central America. The "Costa Rican model" concentrates on high quality medical care delivered primarily by physicians at modern hospitals in urban areas. The costs of such a delivery system are high, even when they are spread over many years. They could only be borne by a middle

FIGURE 7

## HEALTH PERSONNEL PER 10000 POPULATION

1975 AND 1983



Solid bar represents physicians.
Crossed bar represents registered nurses.
Unmarked bar represents auxiliary nurses.

Source: Pan American Health Organization 1982, 1984.

income country like Costa Rica if large sums of the national budget are not used by the military and the country is willing to support a large external debt for the loans needed to support such a system. While these conditions exist in Costa Rica, no other Central American country has the income, loan potential, or demilitarized policy capable of supporting such a system. Indeed, even Costa Rica appears unable to continue to do so as its military expands, prices of imported goods skyrocket, and loan availability decreases. Finally, although the Costa Rican social welfare system proved its utility during the last two decades, rural mortality rates 50 percent higher than those in the cities show the limitations even of this laudable model.21

A second model finds its expression in the poor countries closely allied with the economic and political policies of the current U.S. administration: El Salvador, Honduras, and Guatemala. These countries have no apparent plans to change their health systems radically or develop a national health policy capable of dealing with the massive deprivation in their countries. Loans and grants are, however, being made available for model projects which may promote greater political stability. Largely organized and run by the U.S. State Department's Agency for International Development, these projects often deal in a top-down fashion with needs for improved nutrition, immunization, and sanitation in a manner which avoids challenging vested interests. As a result, local support tends to be passive and transient.22 Like the Alliance for Progress program of the 1960s, even the best of plans may not work unless the local groups who deal with the issues-churches, peasants unions, and literacy workers - are involved in the planning and implementation. Their involvement seems to be key only in parts of their countries controlled by leftist insurgents, outside of the effective jurisdiction of the central government.23

The third model - Nicaragua's - takes full advantage of that grass roots activism. It can be seen as a product of twenty years of rural health experiments in Guatemala, Honduras, and El Salvador in isolated areas and indigenous communities where efforts have been made to organize the poor to improve their lives.24 This movement for community participation is based on the premise that even among the poorest sectors of society there exists a potential to organize local resources for improved sanitation, health, agriculture, and education. Since organizing the poor can lead to pressure for change in traditional power structures, it has found a greater expression in Nicaragua since the revolution than anywhere else in Latin America.25 The explosive growth in community participation has made possible the doubling of the number of health centers and medical visits, a 60 percent rise in the number of hospitalizations, a doubling of prescriptions, and a tripling in the number of vaccinations in the last five years. Health campaigns dealing with sanitation, malaria control, breast feeding, nutrition, and oral rehydration appear to be partially responible for these improved health indices in Nicaragua.

Indeed, the participatory approach in Nicaragua is no panacea. It has required a tenfold increase in the number of medical students, a fourfold rise in pharmaceutical importation, and enormous administrative difficulties. Because of the much more intensive utilization of the health system since 1979, the demand for hospital care has also grown. Five new hospitals have been built, but it is still felt that more attention must be given to the system of secondary and tertiary care which provides backup to the new primary health care system. Notably, the Nicaraguan model has not required the regimentation often presumed to accompany the development of a national health system. Most physicians maintain private practices, and private hospitals still serve the affluent. Even the social security system maintains financial independence, although its services are now administered by the Ministry of Health and are accessible to the general public.

## Conclusions

U.S. citizens, governmental organizations, and humanitarian agencies have been involved in Central American for more than a century. Increasing strife in the region has brought an upsurge in U.S. involvement, both military and medical, in all countries. Even in Nicaragua, private aid and physicians from the U.S. assist the growth of the new health system while U.S. - financed "contras" aim to destroy this development. The U.S. government plans to spend 6 times more for military purposes than was spent for health care and family planning in Central America in 1975.26 It is important to remember that the problems which reach our headlines today have developed over many years and will not likely disappear tomorrow, no matter which policies the U.S. chooses to pursue.

A short-sighted national policy is likely to backfire on attempts to assist the region. For example, expanded U.S. military aid to Honduras in recent years has forced that country to divert funds from social programs in order to support its new military apparatus. This has resulted in greater instability in that country, and was a contributing cause of the ouster of the top military officers earlier this year.

An arbitrarily imposed system of U.S. - style democracy and health care will not likely work. As the Kissinger Commission has recognized, "We should not seek to impose our system on those countries, but should seek to expand upon and improve the structures already in place. Central America must develop a system of health care suitable to its own needs."27

To assist Central America effectively, each country must be helped to implement models developed by national leaders and community groups of the country. Further, our aid must help these countries to decide together what actions to take. Disease knows no boundaries, and as long as physical and social deprivation prevails in the region, no country of the region nor the U.S. will be immune to its effects. It must be remembered that the worst epidemic of all would come from increased warfare into which the Central American countries could be drawn. To contribute to peace and social development, external assistance must promote cooperation among the countries, and nonexclusion of any one of them in planning short- and long-term solutions to their health problems. In this way, understanding and cooperation among the countries can be effectively promoted.

The Pan American Health Organization has brought together the ministers of health of the Central American countries in recent months to make a five-year, overall health plan. The program calls for a total of about a billion dollars, half of which is to come from the countries themselves, for programs including extending primary care, training health workers, purchasing pharmaceuticals in a revolving joint fund, providing nutritional assistance, controlling malaria, and preventing infant deaths. Such a program can serve as a model for cooperation among the countries and donor agencies and governments.

NOTES

1. In addition to Costa Rica, Honduras, Guatemala, El Salvador, and Nicaragua, Belize and Panama are sometimes considered part of Central America. For cultural and historic reasons Belize is usually considered part of the Caribbean basin group of countries. Panama, a former province of Colombia, officially joined Central America in 1984. Although it is not analyzed here, Panama shares many demographic, morbidity, and mortality patterns with Costa Rice.

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4. Pan American Health Organization, Necesidades Prioritarias de Salud en Centroamerica y Panama, Documento Basico, San Jose, Costa Rica, 1984.

5. G. Thomas Strickland, Hunter's Tropical Medicine, sixth edition. Philadelphia: W. B. Saunders Company, 1984.

6. Jose Carlos Escudero, "Los Sistemas de Informacion en Salud en America Latina," Revista Centroamericano de Ciencias de la Salud 5, 14(1979), pp. 109-122.

7. Pan American Health Organization, Health Conditions in the Americas, Washington, D.C., 1982, Scientific Publication No.427,; Health Conditions in the Americas, Scientific Publication No. 364, Washington, D.C., 1978.

8. See Fernando Gatic, "La Urbanization en America Latina," Notas de Poblacion 3, 9(1975), pp. 9-34.

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11. Peter Rosset and John Vandermeer, eds., The Nicaragua Readers. New York: Grove Press, 1983.

12. Hugo Behm, "Mortalidad en los Primeros Anos de Vida en Paises de America Latina," Celade, Serie A, #1024-1032 y 1036-1039, 1976-1978; "Socio-Economic Determinants of Mortality in Latin America," Population Bulletin of the United Nations No. 13 (1980), pp. 1-15; "Mortalidad en America Central: Realidad Actual y Perspectivas," Revista Centroamericano de Ciencias de Salud 7, 19(1981), pp. 9-35.

13. Pan American Health Organization, 1984, op. cit.

14. Second Public Health Commission to El Salvador, Health and Human Rights in El Salvador, Committee for Health Rights in El Salvador, New York, 1983; Amnesty International, Extrajudicial Executions in El Salvador: Report of an AI International Mission to Examine Post-Mortem and Investigate Procedures in Policital Killings, Amnesty International Publications, 1984.

15. Behm, op. cit.

16. Richard Garfield and Eugenio Taboada, "Funding and Practice Reforms for Health Care in Revolutionary Nicaragua," American Journal of Public Health, October 1984; see also David Halperin and Richard Garfield, "Development in Health Care in Nicaragua," New England Journal of Medicine 307(1982), 388-392.

17. The World Bank, Health Sector Policy Paper, Washington, D.C., 1980.

18. Pan American Health Organization, 1984, op. cit.

19. Pan American Health Organization, Situation of Malaria Programs in the Americas, Washington, D.C., 1983.

20. Richard Garfield and Sten H. Vermund, "Changes in Malaria Incidence After a Mass Drug Administration Campaign in Nicaragua," Lancet (August 27, 1983), pp. 500-503.

21. Behm, op. cit.

22. James R. Heiby, "Low-Cost Health Delivery Systems: Lessons from Nicaragua," American Journal of Public Health, 71, 5(1981), pp. 514-519.

23. Ricardo Zembrana Dias and Pedro Huertas, "Aportes Para la Comprension del Comportamiento del Sistema de Salud en el Marco de las Guerras Poulares de Liberacion," Revistas Centroamericana de Ciencias de la Salud 6, 17(1980), pp. 135-142.

24. "Sistemas de Salud y Participacion Popular en Centroamerica," Revista Centroamericano de Ciencias de la Salud 6, 17(1980), pp. 29-38; see also David Werner, "Health Care and Human Dignity - A Subjective Look at Community-Based Rural Health Programs in Latin America," Contact (June 1980), pp. 91-105; The Economic Commission for Latin America, "Popular Participation in Development," Community Development Journal 8, (1973), pp. 77-92; Frederik Muller, Participacion Popular en Programas de Atencion Sanitaria Primaria en America Latina, Universidad de Antioquia, Facultad Nacional de Salud Publica, Colombia, 1979.

25. Garfield and Taboada, 1984, op. cit.

26. Report of the National Bipartisan Commission on Central America, Washington, D.C., January 1984; "AID Submits Budget for Fiscal 1985," Horizons (Spring 1984), pp. 6-8.

27. Ibid.

# THE DILEMMA OF SUCCESS: REVOLUTIONARY ACHIEVEMENTS IN NICARAGUAN HEALTH*

THOMAS JOHN BOSSERT

Department of Political Science
Sarah Lawrence College
and
Harvard School of Public Health

Taxi drivers always complain about national problems, so it was no surprise to find my Managua cabbie ranting on about shortages of meat, gas, and spare parts which he blamed on the Sandinistas and the state bureaucracy, but then he suddenly turned to me and said, "You know, the one thing this government has been able to do well is provide health care. We have more and better hospitals, more doctors, we are more aware of health and nutrition problems and we've had several good vaccination campaigns." As my research progressed it became obvious to me also that, while other sectors of Nicaraguan economic and social life were suffering major difficulties, the health sector had made significant, visible gains in five years of revolution.[1]

They had much to overcome. Health care conditions under Somoza were among the worst in Central America. The health system was one of the most inefficient and inequitable and most oriented toward curative, rather than preventive, services. Like the rest of the Somoza regime, the health system was a highly centralized, patronage system, which at the same time was fragmented into many weak and competing institutions and programs. The Sandinistas were quickly able to unify the fragmented system and to make it more responsive to popular demands. They upgraded both hospital and preventive programs, in some cases with dramatic results. Hospital and clinic utilization mushroomed. Training programs to multiply the number of physicians and other health professionals were accelerated. Immunization and sanitation campaigns were particularly effective, and a broad network of oral rehydration centers appeared to have made marked inroads in reducing mortality from diarrhea - once the main killer of children under 5 years of age. Also important was the successful effort to promote genuine popular participation which involved both voluntary efforts to implement programs and a means to make health officials more responsive to community demands and needs. All these achievements contributed to the legitimacy of the Sandinista government - gaining even grudging acknowledgement from opponents of the regime.

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*From Nicaragua: The First Five Years, Thomas Walker, ed. Copyright 1984, Praeger Publishers. Reprinted courtesy of Praeger Publishers and the author.

This very success, however, posed a classic dilemma of public health systems: the difficulty of achieving improved health status and growing political legitimacy while also maintaining an acceptable level of public spending for health services. This dilemma involves a choice of the appropriate balance between high-cost, hospital-based, physician-oriented, curative care and the more efficient, community-oriented preventive programs. In most health systems curative care is given overwhelming priority; however, curative care is often the most costly and least effective method of approaching the problem of providing health for a population. This is especially true in Third World countries where the most prevelant causes of death and illness are diseases we are now able to prevent in more developed countries: diarrhea, respiratory and infectious diseases. Furthermore, curative care is subject to ballooning cost increases that few nations have been able to contain. Physician-based curative care is also primarily available in urban areas; making it equally available to low-population areas is far too costly for Third World countries. Preventive programs are generally more equitably distributed.

Most international health experts now agree that programs designed to address preventable diseases with community-oriented, non-physician health workers are a much more effective and efficient means of improving health in Third World countries.2 These programs are part of an approach called primary health care which emphasizes activities designed to organize the community to improve water supplies, build latrines, clean up the local environment, and to provide pre- and post-natal care, health and nutrition education and vigilance, continual first aid, and when necessary, referral to higher levels of care. Considerable emphasis in this primary care approach is placed on participation of the community in health activities and in decision-making about health programs.3

Nevertheless, the consequences of failing to shift health policy toward the preventive primary care approach are great. The curative care system is the most prone to growing popular demand for services, least amenable to equitable distribution and access, and most subject to accelerating cost increases. Its growth either means a trade-off within the health sector--making fewer resources available for the more efficient preventive programs; or it means a growing health budget -- a trade-off with other social and economic goals and priorities. This last trade-off is probably the most important since it is likely that advances in social and economic well-being have a greater impact on health than do health services themselves.4 Furthermore, as my cabbie's remarks suggested, gains in health may be made at the cost of resources that might have been applied to solving problems in other areas of the economy. This trade-off might gain legitimacy through health services at the cost of a loss of legitimacy through failures in other sectors.

By 1983 the Sandinista revolution had made serious and impressive strides forward in both curative and preventive programs. Their achievements in both areas already matched or exceeded those of most other Central American countries. They were on a path that could shift the balance of health policy more securely into less costly preventive programs. However, they were still at an uncertain juncture along that path. They still had not squarely faced the dilemma of the trade-offs within the health sector and between health and other social and economic priorities. The curative sector continued to account for at least 85% of the national health budget -- a figure comparable to that of other Central American countries. Perhaps more dangerous, at a time of economic crisis and external invasion when conserving resources for economic and military priorities was of prime importance, they had not controlled the accelerating costs of the health sector, which by most estimates grew much more rapidly than other sectors in the government budget.5 The gains in primary care were made as part of a generally expanding health budget and not in terms of trade-offs within the health sector. This early failure to impose trade-offs by restricting the curative care system was likely in the future to make it increasingly difficult to impose a more equitable and preventive system and to restrict growth in health sector spending -- the classic problems of most health care systems.

We should not be surprised that the Nicaraguan revolution had not been able to overcome the curative emphasis of its health system. Few nations had. The other Central American health systems had also only made tentative shifts in health policy toward primary care. The most effective Central American system, that of Costa Rica, made primary care gains the same way Nicaragua did -- at the same time as advances in hospital care were accelerating and at the cost of resources that might have gone to other sectors.6 Cuba, too, has a highly curative and very costly system.7 However, the Nicaraguans have been more creative and more cost conscious in their policies in other sectors of the economy and society. Their failure to achieve a more efficient and rational health system than their neighbors will be discussed in the context of broader successes.

## Health and Health Services Under Somoza

There is little doubt that the health conditions of Nicaraguans during the Somoza dictatorship were extremely poor, similar to other repressive Central American regimes, like those of Guatemala and Honduras. Life expectancy was 53 years, and infant mortality, often taken as an indicator of the general health status of the whole population, was estimated at an extremely high rate, between 120 and 146 per 1,000 live births.8 Guatemala and Honduras had similar high rates, while by contrast wealthier and more progressive Costa Rica had a life expectancy of 70 years and infant mortality of 29 per 1,000. As in Guatemala and Honduras, preventable diseases were the principal causes of death; diarrhea and infectious diseases accounted for 31.4 percent of all deaths and over 50 percent of infant mortality. Measles, tetanus and polio were major causes of illness and mortality. Malaria and tuberculosis were endemic and growing problems. Nutrition levels were also extremely low, contributing to mortality from other causes: 66 percent of children under 5 years of age were estimated to have some degree of malnutrition.

At first glace, the Somoza health system appears not to have been severely inadequate to the task of caring for the rather small population of 2.3 million. In 1977, there were fifty hospitals and clinics with a total of 4,675 beds, or 2 per 1,000 people. In 1975, it was estimated that there were 1,357 doctors in Nicaragua, a fairly high average of 6 per 10,000 people. These figures compared very favorably with Guatemala and Honduras and were not far below those of Costa Rica. Nicaragua was spending between 15 and 20 percent of its national budget in health, or 2 to 4 percent of the GDP, compared to Costa Rica which spent around 30 percent of its national budget, or 5 to 6 percent of the GDP.[9]

Nicaragua, however, had an extremely inequitable health system. Like most public health systems, the Nicaraguan system did not serve the upper class -- those who could easily afford private medical care and who could go to the United States for specialized treatment. Nevertheless, the system tended to favor the better-off middle classes in urban areas. For instance, the Social Security Institute (INSS) -- which, like most Latin American social security agencies, provided a significant portion of the medical care in the country, an estimated 40 percent of the health sector expenditures -- served no more than 10 percent of the population. This 10 percent was almost entirely urban employees in fairly secure jobs. While the public hospital system was officially responsible for both urban and rural areas, it overwhelmingly favored the former, a phenomenon not unusual in Central America but perhaps more extreme in Nicaragua. In 1973, over half of the hospital beds in the country were in the three major cities and only five health facilities with beds were in rural areas. Even the most simple facilities (the health centers without beds) were much more prevalent in urban than rural areas. Only 35 out of the 119 health centers were in rural areas and most were staffed with untrained auxiliary nurses. While Managua had only 25 percent of the population, 50 percent of the physicians and 70 percent of the professional nurses worked there. Urban areas had averages of more than 11 physicians per 10,000 population, while the countryside had 2.5 or fewer. Provision of potable water and sewage systems were also skewed toward urban areas.

Inefficiency of the hospital system, again, is not unusual for Central America, but may have been even more extreme in Nicaragua. In stark contrast to what happened after the revolution, the hospital services of Somoza were not being used. In spite of the large number of hospital beds in the country, there were only 4 reported hospital discharges per 1,000 -- compared to 26 discharges per 1,000 in Honduras. Most health facilities were in extremely poor condition, lacked necessary equipment and medicines, and had very low utilization rates.

A general problem of public health systems in Latin America is that usually two major institutions are responsible for health facilities -- the Ministry of Health and the Social Security Institute. This dual system often leads to duplication of services and tremendous inefficiencies. The Nicaraguan system was unusual in that it not only had this dual character but was actually even more fragmented.10 In addition to the Ministry of Health, which was primarily responsible for preventive medicine and small clinics, there were autonomous governing boards for each public hospital (nineteen Local Social Assistance Boards [JLAS]) and another national agency responsible for financing hospital construction through the national lottery (National Social Assistance Council [JNAPS]). This fragmentation added to the confusion in a sector which also had the Social Security Institute, an autonomous water and sewer agency, and military hospitals. Furthermore, even the Ministry of Health was fragmented internally with several vertically run programs that functioned with relative autonomy.

Preventively oriented public health programs were also sporadic and poorly developed. Potable water systems served only 41.4 percent of the urban population and less than 10.9 percent in rural areas. Sewage systems reached only 29.4 percent of the urban population and latrine use in rural areas was extremely limited. Vaccination programs reached few in the target populations. Polio vaccinations in 1974 were administered to only 17 percent of the population at risk and vaccinations for diptheria, pertussis and tetanus reached only 5.7 percent of those at risk. Malaria control programs were increasingly ineffective, in part due to the growing resistance of mosquitoes to the widely used pesticides in agriculture.

What really set Somoza's Nicaragua apart from other Central American countries was that there was no major attempt to improve the system and redress the inequalities. In the early 1970s, Guatemala, Honduras, and Costa Rica began significant new programs that emphasized primary care and preventive activities for their extremely underserved rural areas. These programs actually did shift the expenditure patterns of the governments, demonstrating much more of a commitment to public health programs for rural areas than was apparent in Somoza's Nicaragua, where only a few small, foreign-funded primary care programs were initiated in the late 1970s.

## First Steps in Revolutionary Health Policy

One of the first declarations of the new Sandinista government was a clear commitment to improving the health of Nicaraguans. The government's program stated that the new regime would "stimulate and organize popular participation to solve the major national problems: hunger, unemployment, malnutrition, illness, illiteracy and housing -- the despicable results of fifty years of Somocismo." Quickly the new government moved to unite the fragmented health organizations of the Somoza period into a single system under the authority of the Ministry of Health. This gave the Ministry direct control over not only the hospitals in the two Social Assistance systems (JLAS and JNAPS) but also all of the Social Security (INSS) hospitals, ending the duplication of facilities and the preferential medical care for the small percentage of the population covered by Social Security. Furthermore, the new reorganization of the Ministry did away with the variety of semiautonomous vertical programs, all of which were to be fully integrated into the administrative structure of the Ministry.

While unifying the fragmented system, the Ministry also moved to decentralize Somoza's inefficient and unresponsive decision-making process in a variety of ways. They began to create regional offices with greater responsibility and flexibility. While strengthening the national health planning information system, they enhanced the planning role of health officials at all levels.

Perhaps the most significant feature of the new health system was the open commitment to the participation of the community in health programs. The neighborhood Sandinista Defense Committees (CDS) and other mass organizations like the Association of Farm Workers (ATC), the Nicaraguan Womens' Association (AMNLAE), and the local Councils of Reconstruction supported the activities of the Ministry of Health. At the local level and at higher administrative levels these organizations participated in Ministry decision-making in Popular Health Councils. From all reports, this participation was enthusiastic and effective.11 Through these popular organizations the Ministry implemented its immunization campaigns, promoted the installation of latrines, distributed food supplements, and completed a census of children at risk. These organizations began their own initiatives in providing materials, labor, and equipment for construction of health posts and for preventive programs. They also took responsibility for assuring that the price controls for some food items were respected. While it is clear that popular participation was more prevalent in some areas than others -- rural areas were still weakly organized -- and that the Ministry was often unable to respond to popular organization requests for supplies, equipment and manpower, the government clearly made a significant commitment to achieving massive popular participation at a level rarely reached in other countries. Although participation primarily involved organizing people for vaccination campaigns, latrine building, and educational programs, there were efforts to involve the community in decision-making so as to make the health system more responsive to local needs and demands. These efforts were made at all administrative levels of the Ministry. They included weekly meetings between the Minister and representatives of mass organizations as well as periodic requirements for local officials to "Face the People" in large community meetings, in which they were expected to explain health programs and respond to criticism and demands of the local community.

The new government also initiated several major programs in preventive medicine. In the early months it began a widespread vaccination campaign against polio, measles, and other infectious diseases, reaching an estimated 85 percent of the target population. In the first six months, a sanitation campaign distributed 4,200 latrines -- twice the number the Somoza regime distributed in all of 1978.12 Using materials supplied by UNICEF, the Ministry established 250 centers for oral rehydration treatment for diarrhea. These centers, located in health facilities all over the country, provided an easily administered solution of salts and sugar which is perhaps the most effective and inexpensive means of reducing mortality from diarrhea. By 1981 these centers had treated 92,000 children, most of whom were under one year old. Only 2.6 percent needed further treatment and only 17 children died. Nutrition programs involving complementary feeding were also rapidly expanded, reaching over 100,000 children a year by 1981. Population control measures, while not emphasized by the government, were nevertheless made available and by 1982 over 80,000 women, out of an estimated 670,000 reproductive-aged women, were in the family planning program. In association with the Ministry of Education, a program was also developed to add a health education component to the massive literacy campaign in 1980: one out of ten brigadistas was especially trained to promote health activities. In another new effort, occupational health and safety problems were addressed by the formation of promotion and inspection teams in coordination with the Ministry of Labor. In 1982, 6,488 inspections of work areas were made.

Consistent with these early reforms, it was in the first year of the revolution that the Sandinistas had the clearest opportunity to place major emphasis on a new primary health care system. Unfortunately, they did not grasp this opportunity.13 They made many valiant efforts to improve the deteriorating Somoza health system but in the process strengthened the curative hospital and clinic structure, ultimately at the expense of preventive primary care programs.

The central effort of the new government during the first year was to reconstruct the services and economy that had been destroyed by several years of civil war. In the health sector, this emphasis was interpreted as a mandate to restore the hospitals and clinics that had been destroyed during 1979 by the National Guard bombings. The new government, however, soon also committed itself to a major new program of hospital construction. Largely with foreign funding, from Western Europe and the Inter-American Development Bank, five new hospitals were under construction or completed by 1984. This was a popular move that symbolized Sandinista commitment to health. However, restoring hospitals also assured that the high cost of maintaining these services would continue to be the dominant expense in the national health budget.

A second crucial choice involved training of new health professionals. Although all types of health workers were to be increased and to receive more adequate training, it was the curative professionals -- doctors and their hospital-based assistants -- that received the greatest attention. Existing medical school facilities were expanded at the university in León, an additional medical school was created in Managua, and the entering class of medical students jumped from 100 to 500. While on the surface it might appear that more physicians would improve a health system, physicians are trained primarily to cure sick people and only add to pressures for curative and higher cost services rather than the more effective and more mundane preventive programs. Furthermore, physician salaries are considerably higher than those of non-physician health workers, even in more equalized salary systems like Nicaragua's. In 1983, physicians received three to four times the salary of auxiliary nurses, and could more than double this salary in private practice.

These two choices -- expanding both hospital construction and physician training -- were to set the basis for a long-term structural necessity to give priority to the curative sector. Both hospitals and physicians require continual high levels of funding to be effective in delivery of care. A poorly supplied, equipped and maintained hospital or clinic generates demands for improvements from both staff and users -- demands that few political systems successfully resist for long periods. Once health care -- especially the availability of curative care -- is made a cornerstone of a regime's legitimacy, as it has been in Nicaragua, it is all the more difficult to resist demands to maintain and upgrade an established curative system.

Why, then, when the Sandinistas were initiating broad reforms in the health sector did they miss the opportunity to place stronger emphasis on primary care and avoid the pitfalls of an expanding curative system? The most immediate reason was that physicians with little or no public health or preventive medicine training dominated decision-making in the Ministry during the first year of the regime. Evidence around the world suggests that physicians in policy-making positions in health ministries seldom grant sufficient priority to preventive programs.[14] Physicians were chosen apparently because the Sandinistas felt it necessary, in their broader interests of creating an enduring alliance of classes, to assure the continuing support of physicians and their middle-class clients.[15] Furthermore, taking their ideological inspiration from Cuban and Soviet models, which emphasize curative care, the Sandinistas incorrectly viewed primary care as "second-class" care since it did not emphasize the use of fully trained physicians.[16] They were also encouraged by initial foreign donations from Sweden and West Germany, which provided funds for the construction of two hospitals, and by the brigades of international physicians who came to provide curative care in previously inaccessible rural areas. Perhaps most important, the Ministry had to respond to an immediate and rapid growth in popular demand for curative services. This general policy appeared to respond to the immediate demands from the crucial urban and semiurban areas from which the Revolution had drawn its initial and most important political support. In the health sector, it was this population that appeared to be flooding the hospitals which they had avoided under Somoza but now considered to be rightly theirs, and it was in these areas that the most widespread spontaneous creation of popular clinics occurred. In order to consolidate its base of support in the early period of the regime, the Nicaraguan revolutionary government emphasized an immediate response to this demand.

## Initiating Primary Health Care Programs

By 1981 a variety of converging forces managed to initiate changes in Ministry policy which finally brought a greater emphasis on preventive programs. While not a major shift away from the curative orientation, nevertheless these efforts successfully fostered a new and important commitment to primary care activities. Crucial to these changes was the appointment of a non-physician as Minister of Health. Replacing Dr. Cesar Amador Kuhl, a highly specialized neurosurgeon, Lea Guido built on her previous experience as Minister of Social Welfare to encourage the Health Ministry to place less emphasis on the expensive curative system and more on outreach community programs. In addition, as an important militant of the Frente Sandinista de Liberacion Nacional (FSLN), Guido had a base of political support from which to modify the physician dominance in the Ministry. She was aided in this effort by many public health officials in the Ministry, including the large Departments of Health Education and of Preventive Medicine. Furthermore, the Pan American Health Organization -- committed to promotion of primary care strategies in Latin America-- increased its primary care advisors and stepped up efforts and funding for primary health care activities. UNICEF also expanded its successful oral rehydration program.

The results of these changes in the Ministry were twofold. First, a systematic program of large-scale public health activities was organized as massive weekend vaccination and sanitation campaigns called "Popular Health Days". These programs involved periodic nationwide efforts in which the

Ministry coordinated and supplied volunteers from the mass organizations and neighborhood CDS's, to immunize against polio, tetanus, diptheria, and measles, and to become involved in sanitation projects and assist in malaria control. Five Popular Health Days involved over 30,000 volunteers and gave over one million doses in three separate phases in 1982.17 These campaigns appear to have been largely responsible for the rapid decline in incidence of transmissible diseases: polio dropped from 101 cases in 1979 to none in 1982, diptheria from 11 to 2 and measles from 1,270 to 226. In 1981 an unusual massive three-day campaign distributed anti-malaria pills to an estimated 75 percent of the population in an attempt to break the disease chain and facilitate subsequent control efforts. These immunization campaigns also contributed to health education and popular participation in general health programs. For all their success, however, these efforts are best seen as temporary approaches to disease control. The mobilizing efforts can be quite costly compared to permanent multipurpose community services -- although not nearly as costly in the long run as curative efforts. Furthermore, continual vigilance and control efforts necessary after large-scale campaigns are best achieved through a permanent network of primary care health posts and outreach activities of non-physician health workers. Massive campaigns can have dramatic effects on disease patterns but a more permanent system is necessary to continue maintaining low levels of disease.

The second initiative was an attempt to address the need for this permanent network by creating a department of primary health care in the Ministry. This department was responsible for the construction and rehabilitation of 363 health posts and the special training, equipping and supervising of auxiliary nurses to work in these health posts and in outreach programs in the local communities. This program represented the first major nationwide, institutionalized effort in primary care ever achieved in Nicaragua. A program similar to the efforts initiated in the mid-1970s in the rest of Central America, it represented a significant beginning, but by no means a full-scale, commitment to primary care. As in the other Central American countries, the portion of the national health budget committed to this program was low -- no more than 15 percent -- and the number of health posts and auxiliaries was sorely insufficient to meet goals of broad coverage and easy access. Despite the construction of 300 new health posts, in 1984 there were still only 1.5 posts per 10,000 people, and many in rural areas were still denied any real access to continuous health services.

## Future Trends

One of the hallmarks of an equitably oriented socialist state is a strong planning institution. Planning is a potential means of promoting a more efficient and rational allocation of resources, especially if it is capable of overcoming the structural political power of established service bureaucracies and interests. Effective planning can be responsive to local needs and correct for inefficiencies if adequate participation, responsibility and information systems are developed.[18] In the health sector, health planning efforts around the world have given rise to greater awareness of inequalities and inefficiencies and have been an important tool for increasing equity and efficiency in some countries. Coordination between health planning activities of ministries of health and strong national planning ministries have been particularly conducive to sponsoring and maintaining greater efforts in primary care and constraining growth in the urban-oriented curative sector.

In Nicaragua, health planning has steadily improved from its very weak stature -- almost nonexistent -- under Somoza and during the first year of the revolution. Planning activities during the Somoza period were initiated by the Pan American Health Organization and USAID and received little support from the Ministry. In the first year of the revolution, there was no operating planning office, and the health information system was in frantic disarray. Incremental efforts since then have established a functioning planning office with trained health planners, an increasingly sophisticated health information system, and greater participation at all levels in the Ministry in health planning activities.

These efforts established the basis for a more powerful role of planning but they were not yet sufficient to constrain the growth of the curative sector. Indeed, some health planning efforts led in the opposite direction. One major planning document, the Prospective Plan, projected a capacity to fund a considerable growth in the hospital sector as well as replace auxiliaries in the primary care system with fully trained physicians and larger staffs.[19] This plan was based on wildly optimistic economic assumptions, and although it was soon recognized as an unrealistic guide for yearly planning, it was still seen as a goal toward which the health system should be oriented.

There were several reasons for the failure of health planning to make significant changes in the health system. First, planning officials themselves were not committed to reducing the cost of health care. The chief of planning was trained in a more curative-oriented system and was suspicious of the "second-class" appearance of primary care. Furthermore, within the Ministry, health planning was still not given the high priority necessary for it to guide the hard distribution choices. But perhaps more important was the general weakness of planning in the rest of the national government in Nicaragua. The Ministry of Planning was underfunded and dependent on other ministries for planning and financial data. Only one official at the Ministry of Planning was responsible for the health sector, and she had to rely entirely on the Ministry of Health planning office for statistical information and analysis. This structure meant that there was little pressure from the national level to encourage the Ministry of Health to restructure its priorities and contain the high-cost, curative sector. While the yearly budgeting process provided some clear constraint, it tended only to establish a budget ceiling (which nevertheless continually expanded as extraordinary funding was made available to the Ministry) and paid little attention to internal distribution of Ministry funds. Furthermore, since health budgets after 1980 were a growing proportion of the national budget, there was little structural incentive to reduce long-term Ministry expectations of continued growth in the health budget. Current financial constraints were seen as temporary obstacles which did not force a significant reordering of priorities.

Two other conditions suggest that needed tradeoffs in the health sector would be increasingly difficult to achieve. First, the health system had one of the two most powerful unions in Nicaragua, with a long history of militancy even during the Somoza period. During the late 1970s this union, FETSALUD, led courageous strikes that helped mobilize opposition.[20] It was also one of the few successful unions to gain wage concessions prior to the government's wage freeze. The wage structure under Somoza was so low, inequitable and inconsistent that the initial wage restructuring appeared clearly justified. However, since FETSALUD primarily represented hospital workers, one damaging consequence of its successful wage struggles was to add to the cost of maintaining the hospital sector and reduce the resources available for primary care programs.

Physicians also mobilized successfully to press for their particular interests in curative care. The medical association, FESOMENIC, created after the triumph of the revolution, joined a larger interest group of professionals, CONAPRO, with direct representation on the Council of State. While tensions between conservative and progressive physicians led to splits within FESOMENIC, both groups tended to pressure the government effectively for physician dominance in the health sector and limit government regulation of private practice.

A second, and perhaps more complex, impetus toward curative care was popular demand. As noted above, popular demand for hospital and clinic care grew rapidly immediately after the fall of Somoza. With increases in popular participation and incentives for health officials to be more responsive to demands of mass organizations and of local communities in the "Face the People" meetings, demand for curative care was increasingly hard to resist. The wrenching dilemma of popular participation is the difficulty of achieving broad popular awareness of needed trade-offs and of the significant benefits of prevention-oriented primary care. Popular participation contributes to growth in popular awareness of health issues, popular willingness to join effective programs, and responsiveness of health officials to local needs, but it also clearly increases the demand for more costly, curatively oriented care. This demand is particularly critical when the health sector has assumed a crucial role in legitimizing the regime.

What could have been done to reverse these trends? Especially in a period of economic decline and external invasion, resources devoted to the least efficient, high-cost social service needed to be reallocated to more pressing economic and military needs. The community-based, low-cost, preventively oriented and more effective primary health care system needed to be granted much higher priority. However, the government had achieved a considerable amount of popular legitimacy precisely because it had devoted much of its resources to hospital and clinic, doctor-oriented care. Having missed the chance early in the revolution, the Sandinista government could not significantly withdraw from the high-cost sector without risking some deterioration of popular support.

Future commitment to primary care depended on the ability to resist pressures for new hospital construction and to reduce physician training while at the same time increasing spending for water and sanitation projects, auxiliary nurse training and community-based health posts.

There would be no easy way to achieve this long-term incremental shift.21 It was likely that a strengthening of the coalition of forces that allowed the introduction of primary care could continue to lead the way. Non-physician, social service officials like Lea Guido, with an independent base of political support within the FSLN could play a greater role in Ministry decision-making. Personnel decisions based on public health credentials rather than physician training could be emphasized within the Ministry. International agencies that promote primary care, such as the Pan American Health Organization and UNICEF, could continue to exert pressure, while at the same time international funding sources for hospital construction could be strenuously resisted.

Perhaps most important, the Sandinista government probably needed to establish a much stronger planning ministry, with independent sources of information, adequate, well-trained staff, and control over the budget. This agency would have not only to establish ceilings but also to make decisions about distribution of services.

Finally, building on the growth of active popular participation, the effective health education campaigns, the "Popular Health Day" activities and the "Face the People" meetings could place increasing emphasis on the need to make rational trade-offs and place greater priority on primary care programs. In 1984, there was some evidence that popular pressure for preventive health programs was growing, although it did not yet seem to be couched in terms of trade-offs with curative programs. Government programs in other areas suggest that such efforts could be effective if given proper priority. For instance, in the Farm Workers' Association (ATC) widespread recognition of the need for workers to increase production while restricting demand for wage increases was achieved early in the revolution. Other efforts to develop popular recognition of the need for austerity were also somewhat successful. Such an effort in health might increase recognition of the more important role preventive programs play in bringing health to the population and in the process gain legitimacy for the regime that was promoting such activities.

By 1984, the Nicaraguan revolution had produced a successful health system of which they were rightly proud. It had achieved significant reductions in major diseases, had apparently reduced infant mortality, and had begun to make changes in living and working conditions that were likely to improve health. It had also made available a complex health care delivery system that made easy access a reality for most of the Nicaraguan people. The combination of health improvements and access to services made a major contribution to the legitimacy of the regime. I have suggested here that this success has produced a dilemma because the health system was not as prevention oriented or as egalitarian as it could have been and because it was likely to become increasingly costly to maintain its overwhelmingly curative institutions. This argument was not intended to take away from the achievements, but rather to note continuing inequalities, to warn against the future drain on the increasingly scarce resources of the country, and to suggest lessons for future revolutionary regimes in other countries. Early choices might have been made to enhance radically the primary care sector and limit growth in curative care without necessarily weakening the legitimizing capacity of the health system. Later choices would have to be more incremental and would involve restraining very powerful, structurally induced pressures for growth in curative care. All governments currently face these choices. Revolutionary regimes, however, should have greater structural and moral capacity to rationalize the health sector and reduce its costs.

## The Counter-Revolution

The U.S.-funded invasions of Nicaragua by the contras, counter-revolutionaries based in Honduras and Costa Rica, had special consequences in the health sector. They, of course, destroyed lives and productive capacity in target areas, adding casualties that needed to be attended by health services and weakening economic and social conditions necessary for health improvements. By one estimate, over 1,000 people were killed and 56,000 forced to flee to refugee areas by early 1984. Accompanying this disruption were upsurges in infectious and contagious diseases, such as malaria and diarrhea, which reached epidemic proportions in some areas near the Honduran and Costa Rican borders.22

The health system itself had also become a special target. Health workers, including foreign physicians and local volunteers, were threatened, tortured, and killed. Rural health posts and clinics, as well as medical supply lines, became special targets for destruction. In the Miskito areas of the northeast near Honduras, where the contras were initially most active, one of the most successful primary care systems was all but destroyed by mid-1983.

These special direct attacks on the health system appear to have been motivated by the very success of the health system in gaining popular legitimacy for the regime. The contras were targeting the health workers, posts and medicines, disrupting these important services in order to reduce the capacity of the regime to respond to popular demands for health services. Up to mid-1984, however, the consequences of these attacks appear to have seriously reduced services only in extremely low-density areas like the northeast, and do not appear to have reduced the legitimacy of the regime. On the contrary, as one health official asserted to me, there seems some truth to the saying: "The revolution is like a stake. When struck, it sure hurts. . .but it also becomes more deeply implanted."

NOTES

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16. For analysis of the high-cost Cuban system see especially Roemer, "The Lesson of Cuba."

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22. Richard Garfield, "Nicaraguans' Health," New York Times, February 2, 1984; Mary Elsberg, "Trail Blazing on the Atlantic Coast: A Report on Nicaragua's Health Care Brigadistas," Science for the People 15, 6 (November and December 1983), pp. 14-19.

## NOTES ON CONTRIBUTORS

GUAROCUYA BATISTA V., M.D., is director of the Department of Postgraduate Education, Universidad Autonoma de Santo Domingo, and coordinator for the Caribbean and Central American Section of the International Association for the Study of the Economy of Health.

THOMAS JOHN BOSSERT is a member of the faculty of Political Science at Sarah Lawrence College. Previously he was Assistant Professor of Government/Political Science at Dartmouth College, McGill University, and Swarthmore College. He is also Visiting Lecturer in Health Policy and Management at the Harvard School of Public Health.

Professor Bossert has published in the area of political science, Latin American studies, and public health. His articles, chapters, and reviews have appeared in *Latin American Research Review*, *Comparative Politics*, *Political Science Quarterly*, *Social Science and Medicine*, *Latin American Perspectives*, and *Nicaragua in Revolution*.

He holds an A.B. from the Woodrow Wilson School at Princeton University and an M.A. and a Ph.D. from the University of Wisconsin at Madison.

PETER R. CARR is a health management adviser with the Pan American Health Organization/World Health Organization (PAHO/WHO) and is based at their Regional Headquarters in Washington, D.C. He is a national of Trinidad and Tobago where he worked for several years with that government before joining PAHO/WHO. He has extensive experience on health management issues in the English-speaking Caribbean having worked in this field for the past sixteen years. He is a graduate of the University of the West Indies with a Master's degree in Government.

The late PETER DALTON earned a Ph.D. in social anthropology at the University of the West Indies in 1974. He conducted field work in Australia and Guyana. Since 1968, Dr. Dalton had specialized in water contact studies in St. Lucia and Ghana. At the time of his death, he was involved in a similar research project in Kenya.

MELANIE C. DREHER, Ph.D., is Dean and William R. Ryan Distinguished Professor at the University of Miami School of Nursing. She is author of *Working Men and Ganja*, a sociocultural study of marihuana use in rural Jamaica, and the principal investigator in subsequent studies of cannabis use by women and children in Jamaica.

WILLIAM W. DRESSLER is an associate professor at the University of Alabama. He has conducted research on sociocultural factors in chronic disease in Latin America and the Caribbean. He is currently carrying out a study of sociocultural change and hypertension in Jamaica.

RICHARD GARFIELD, R.N., M.P.H, Dr.P.H., is a staff associate at the Columbia University School of Public Health, Division of Epidemiology. He lived in Central America in 1981 and 1983 and is involved in health projects in several countries in the region, concentrating on the promotion of voluntary efforts by local residents to help reduce the burden of vector-borne diseases.

FRANK McGLYNN received his Ph.D. in cultural anthropology in 1980 from the University of Pittsburgh. He is currently an Associate Professor of Anthropology at the University of Pittsburgh at Greensburg. His research interests and publications are in the Caribbean, slavery, peasant studies and political economy.

IAN RAWSON holds a Ph.D. in Anthropology from the University of Pittsburgh. He is currently vice president for planning, Allegheny General Hopsital and Director of Community Health at Albert Schweitzer Hospital, Deschapelles, Haiti and a consultant with U.S.A.I.D. for several Caribbean Basin nations.

THOMAS SCHORR earned a Ph.D. in Anthropology from Tulane University. From 1977 to 1985 he was senior behavioral scientist with the Center for Human Ecology and Health of the Pan American Health Organization. His work is concerned with effects on health of regional development programs. He is currently Research Professor of Anthropology at the University of Pittsburgh.

CHRISTINE YOUNG received a Ph.D. in Social Work from the University of Pittsburgh. She is an Assistant Professor in the Department of Health Services and School of Social Work of the University of Pittsburgh. She also serves as research director of the Family Health Council of Western Pennsylvania. Dr. Young's current interests include black infant mortality in Pittsburgh and post infant feeding programs in Mexico.